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What Associations May and May Not Do

JUST as twenty years ago a period of trusts came into being, so today has come a period of trade associations, and as the former were investigated and their lawful scope defined, so the latter are being investigated and their legitimate work made plain.

In an attempt to define the legitimate activities of trade associations the Secretary of Commerce put the matter squarely up to the Attorney General. Under eleven general questions he summarized the present activities of most trade associations. The Attorney General does not answer the individual counts with one exception and that relates to a standard system of cost accounting. He thinks that associations should be warned against uniform cost as to any item of expense. He sees nothing illegal in the other activities mentioned, provided always that whatever is done is not used as a scheme or device to curtail production, or enhance prices, and does not have the effect of suppressing competition. He adds, however, that this latter expression is only tentative.

To a degree the inquiry cannot wholly satisfy Mr. Hoover who comes out flat-footed with the proposition that organizations collecting statistical data should publish such matter, as it is of public value. That withholding information secured solely for the benefit of members, and of a character that puts the membership by reason of the information in a position of advantage, as compared to the public without such information, cannot be sanctioned by sound public policy. He also claims that association information published through trade papers should be released to such members only after publication.

To summarize the matter, cost-fixing, price-fixing and suppression of competition are distinctly unlawful. Apparently statistical secrecy must be proved as against public policy before it will be interfered with.

Association activities will therefore probably continue as before, until some political Lexow starts an investigation of associations and calls their officers to tell all they know and much that they do not.

India Rubber Visions

HAD there been no such thing as imagination, india rubber manufacture would probably not have gone much beyond the making of erasers. With the business enormously developed and covering almost every line of human endeavor, visions of future development are correspondingly stimulated and broadened. Imaginings however impossible of realization have a basis of actual need and some may result in future progress. This is why in another column the articles dealing with the rubber business in 1940 and 1952 are called to the particular attention of the progressive and inventive.

A British Rubber Parliament

MR. D. F. L. ZORN recently read a very interesting paper before the Institution of Rubber Industry, London, setting forth the reasons for a parliament of all British rubber interests. That a consultive body embracing various rubber manufacturing associations together with the growers' associations would be of singular value not only to the British trade but to that of the whole world was made very clear through his arguments.

Incidentally the American rubber trade may felicitate itself upon its being in part the example for this movement. Mr. Zorn says:

"In the United States The Rubber Association of America appears to be a federation of a pretty comprehensive type. In THE INDIA RUBBER WORLD for last July I notice an imposing list of the committees and divisions composing this association running into some nineteen sections. The Rubber Association of America apparently deals not only with serious questions such as taxation affecting the industry, proposed legislation, rail-

way rates, etc., but in the journal previously named it even announces a twentieth annual summer outing of the association, with a special train operated by the Pennsylvania Railroad, and arrangements for golf tournaments, baseball and swimming."

The Rubber Association's Tire Warranty Successful

THE Tire Manufacturers' Division of The Rubber Association of America, embracing 125 manufacturers and including all of the leaders, has endorsed and sent to approximately 125,000 tire dealers the new Standard Tire Warranty and Claim Form in the shape of a neat wall hanger.

Generous praise is due the management of The Rubber Association for the money and effort expended to eliminate the mileage guaranty with its attendant abuses and losses. Tire dealers in all sections of the country have welcomed the new departure and are lending it their support.

Former tire adjustment conditions were unsound. Clothing, footwear, household appliances and innumerable articles of utility are not sold with a definite guaranty of service and an unsound adjustment policy. There is no good reason why tires should be an exception. The former tire guaranty tended to increase costs, and the purpose of the new warranty is to eliminate economic waste.

Entirely too many of the adjustments formerly made were known as "policy" adjustments, whereby the dealer lost because each tire thus adjusted prevented a new sale by some dealer. It is no exaggaration to say that "policy" adjustments annually took millions of dollars from the dealers alone.

Under the standard warranty and claim form, only those tires which are faulty in material or workmanship will be considered for adjustment. The new condition will eliminate much annoyance and loss of profit to the manufacturer and should remove all apprehension that some other maker or dealer will continue unsound and unbusinesslike adjustments.

The consumer will benefit because each user will pay his own way. If the tire is defective the owner can get fair treatment provided he makes a claim in the specified manner. Careful users will continue to receive fair treatment and others will get only fair treatment as well. Sound merchandising by manufacturer and dealer will thus be advanced.

Dustless Millrooms

THE workman in a rubber factory today is in far better case than his prototype of only a few years ago. This is true in many respects, none more pronounced than the absence of dust. The air in the old-fashioned millroom was so laden with flying particles from lampblack to barytes that it looked like the interior of a flour mill. Dust settled everywhere, the workers were saturated with it, and cases of lead poisoning from flying litharge were not unknown. Today, closed mixers, exhaust hoods and the combination of flocculent ingredients with plastics before they reach the compounding room, have made it practically dustless. The result is better goods, healthier and more contented help.

Tropical Rubber Factories

RUBBER manufacture has in the past chosen temperate zones rather than tropical or subtropical. There has always been a feeling that a cold dry climate produced better goods than one that was warm and damp. It would seem, however, that this belief is not wholly sound. The recent installation of tire-building machines in Natal, South Africa, would indicate that good tires may be produced in the subtropics. There are factories also now taking orders in the Federated Malay States, which indicates that equatorial regions can produce manufactured rubber goods. Whether this is the beginning of a notable manufacturing change, it is hard to say, but it is not beyond the bounds of possibility that coolie rubber workers may one day be employed in large numbers. Thus India, The Dutch East Indies, Africa and the South American countries may one day have prosperous rubber factories.

IT WAS A VERY WISE AND A FRIENDLY ACT ON THE PART of Captain Ernest E. Buckleton to present the famous George Washington portrait of which he was the owner to the Pilgrim Society of London. Deeds of this sort are most effective in binding together the two great English-speaking countries.

THE RUBBER PAVEMENT, ALTHOUGH IN THEORY IDEAL, is in practice not a success, or rather has not proved itself a necessity. Those who urge it the most strenuously are those who desire to get rid of surplus crude rubber. Such should ponder the Hindu proverb, "The road is paved with leather to those whose feet are shod." By the same token the road is paved with rubber to those whose vehicles and whose feet are rubber shod.

IT IS RUMORED THAT THE AGRARIAN COMMISSION OF the Mexican Government is going to pay $25,000,000 to former owners of church lands taken over by the government. Now that the precedent has been established, how about the millions of dollars represented in rubber plantations despoiled by bandits or taken over by the same government?

A RUBBER COMPANY THAT SPECIALIZES IN TIRE REPAIRing material has recently taken a census of the tire repair industry. A very interesting fact brought out is that on an average there is $35 worth of tire repair work yearly per car. Applying these figures to the 10,000,000 cars in the United States the annual business amounts to $350,000,000.

The History of Conveying Belts—I

The Development of This Industry Is Due to the Efforts of Men with Broad Vision and Great Engineering Skill

By Thomas Robins

The first date in the history of conveying belts was the year 1891 when the first true conveying belt was made. Before that time, in what may be termed the prehistoric period, nothing heavier than grain had ever been carried on belt conveyors. Ordinary transmission belts had been used for this purpose. They ran on spool-shaped wooden rollers and as the service was so light, there was no call for great strength or durability in any part of the apparatus.

The pioneer in the attempt to use belts for carrying heavy material was the man who had also been the pioneer in so many other lines—Thomas A. Edison. In the belief that the magnetic iron ores could be enriched profitably by magnetic separation, he bought several large ore deposits in New York, New Jersey and Pennsylvania, and built concentrating plants, of which the largest was at the old Ogden Mine in Sussex County, New Jersey. Here, Mr. Edison spent much effort, time and money, but the ore which had been supposed to contain about 35 per cent of iron was found to be only one-half as rich, and although a fine briquetted concentrate was produced, the venture was finally a commercial failure.

Thomas Robins

When first built, the conveyors in this plant were of the scraper or chain-and-bucket type, but they soon wore out and were replaced by ordinary flat belts that ran between cheek boards which were moved closer together as the edges of the belt were worn away by rubbing against the boards. In from four to six weeks, a 24-inch, 6-ply belt was reduced to a strip 16 inches wide, the center of which would be entirely worn through in spots. The belts had the usual thin cover that was used for transmission belting, 1/32-inch of a short fibrous compound. It is interesting that no one seems to have noticed that this rubber cover, thin and poor as it was, outlasted many times its own thickness of cotton fabric. As a rule, the rubber cover would last from two to three weeks, after which the five or six plies forming the body of the belt would be destroyed in about the same length of time. When I called Mr. Edison's attention to this fact, and proposed to make for him a belt with a thick cover on one side, he at once gave me an order for it. But before making the belt I wished to determine what sort of compound would best withstand abrasion. I therefore went to the National India Rubber Co.'s factory at Bristol, Rhode Island, where I had formerly worked, and prepared a large number of 6-inch discs of rubber, all of them ⅛-inch thick and made of almost every conceivable mixture of ingredients. I took these back to the mine and tested them by exposing each piece to the attack of a heavy falling stream of ore which was very regular in quantity. By weighing each sample before and after the test and noting the resulting loss of weight, I was able to choose the compound whose loss was the lowest and which, therefore, had best withstood the abrasion. I was regretful to find that the best record was made by the purest and most expensive compound. Mr. Edison was game, however, and gave me an order for 500 feet of 24-inch, 4-ply belt with a cover ⅛-inch thick, and with no price specified.

The First Successful Belt Conveyor

When this belt had run for some months with no apparent evidence of wear, Mr. Edison encouraged me to construct improved forms of idlers, and when the first troughed belt conveyor was found to be successful, he did not hesitate to give his recommendation to all the other people who were engaged in the concentration of iron ore. These included the Chateaugay Ore & Iron Co., and Witherbee, Sherman & Co., both of them in the Adirondack region, and several other concerns. His partner, Charles Batchelor, even accompanied me to Wilkes-Barre, and introduced me to the leading engineers of the anthracite coal companies, telling them that he and Mr. Edison had found my belt conveyor to be far more durable than metal conveyors. We received scant attention, however. It would be hard to find a more wasteful industry than was the mining of anthracite coal in the nineties, and economics were not considered important. It was not uncommon for a coal mine to consume 15 per cent of its own production in making the power required to get the coal to the surface. It was not until W. V. S. Thorne, an engineer who had been trained in the Northwest, came into the anthracite country, that the first belt conveyor was installed in that region. It is interesting to note that this man reduced the coal consumption of his mines from 14 to 4 per cent of their product.

But, as already stated, the first real conveying belt was made for Mr. Edison and it was still in good condition when the mine was finally abandoned some two or three years later. As the

Largest Ship-Loading Pier in the World. Four 60-Inch Conveyors—Capacity of Each, 3,000 Tons R. O. M. Coal Per Hour

idea was new, I probably could have patented a belt with a thick cover on the carrying side, but it never occurred to me to do so.

To Mr. Edison I shall always be grateful. I was free to visit his plant at any time to make experiments and to stay as a guest as long as I liked. It was a wonderful experience to be able to watch such a man in action. I well remember him during one week not long before the mine was finally abandoned. The "Old Man," as everyone called him, was making some ex-

periments to determine the best binding material for his briquettes. The work had to go on day and night, and as the weather was cold we spent the nights in the boiler house, the only place where there was any warmth. Once or twice during the night Mr. Edison would snuggle down comfortably to sleep in a pile of buckwheat coal and in an hour would wake up as fresh as a daisy. I don't think we washed at all during the week, and our only food was some cold and pale mince pie, and some equally pale and cold coffee which was brought from the boarding house. It was not a luxurious life for the inventor of the incandescent lamp, the phonograph, and the motion picture. Finally, on Saturday afternoon we heard the whistle of the mixed train that was to take us to a civilized week-end. We hurried to the railroad and flopped into a seat, dirty and tired. A few minutes after the train had started, Mr. Edison's financial man came up with some figures on a piece of paper, and informed him that up to date he had expended at his concentrator something over twelve hundred thousand dollars. After a moment's pause, Mr. Edison still out of breath and covered with dirt, replied with his wonderful smile, "Yes, but I've had a hell of a good time!"

Pneumatic Tires Incidental to Conveyor Development

Having learned in the experiments just described that the best rubber compound would withstand far more abrasion than would a piece of nickel-steel of the same size and thickness, it occurred

Forty-Two-Inch Conveyor — Capacity, 750 Tons Iron Ore Per Hour

to me that it would be practicable to make rubber-covered pneumatic tires for heavy vehicles. At that time, in the winter of 1892, there were no automobiles in existence, and bicycles were the largest vehicles on which pneumatic tires were used. I discussed this matter with my friend, the late Peter Cooper Hewitt, who jumped at the idea, and together we decided on the design. He also obtained for me orders for eight tires, four of which were for the horse-drawn brougham of Mrs. Rhinelander Stewart, and the others for Mr. Frank Work, the well-known banker and horseman, who put them on his road wagon.

Special wheels with felloes 3-inches wide were made for both carriages. Along the edges of the felloes, at intervals of about an inch, small holes were drilled to hold the lacing which ran through corresponding holes in the shoes of the tires. The tires were built up on a mold which consisted of a piece of suction hose bent into a circle. The tire was then wrapped with sheeting and cured in a large heater. The inner tube was a long bag of pure stock closed at one end and fitted at the other end with a piece of pure gum tubing. When the tires were finished we laced one edge to the felloe and laid the inner tube in place with the neck of rubber tubing projecting through a hole in the felloe. Then we laced the other side of the shoe, and inflated the tire. As there was no valve we simply doubled the tubing back upon itself, and wrapped it with cord. All of these tires were used regularly and were probably the first pneumatic tires that were ever made for any vehicle larger than a bicycle. The incident is mentioned here because these tires were a by-product of the development of the conveying belt.

Improvements in Construction

Having noticed in my observation of belt conveyors that practically all of the wear came on the central third of the belt's surface, I next made a belt whose cover was ¼-inch thick at the center and reduced to 1/16-inch at the edges. The first one of this type was made for the Chateaugay company, and it wore well, though it had the defect of excessive stiffness at the center where a conveying belt ought to be flexible. This form of belt was patented in 1893. The first 30-inch belt conveyor was made for the Atlas Cement Co. at about the same time.

The next improvement was the "stepped-ply" belt, the first of which was made for the Magnetic Iron Ore Co., Benson Mines, New York. This construction produced a belt flexible at the center and of gradually increasing stiffness at the sides, and it retained the advantage of a cover which was thickest at the center. This belt, although made a year or two earlier, was patented in 1896. In the latter year, also, the Robins Conveying Belt Co. was incorporated.

HARVEY S. FIRESTONE AGAIN OFFERS SCHOLARSHIP TO HIGH SCHOOL STUDENTS

For the third consecutive year Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio, offers a four years' university scholarship to high school students for the best essay on "How Good Roads Are Developed in My Community." As on previous occasions, the intention is to arouse thought and study concerning some of the problems of highway transportation, economics and engineering. All students of high school grade, including both public and private schools, are eligible to compete, the scholarship being valued at not less than $4,000. Those wishing further details should communicate with The Highway and Highway Transport Education Committee, Willard Building, Washington, D. C.

FIRESTONE AND GOODYEAR OFFER FELLOWSHIPS IN STUDY OF RUBBER CHEMISTRY

The Firestone Tire & Rubber Co. and The Goodyear Tire & Rubber Co. are offering at the University of Akron, during the academic year 1922-23, two fellowships in the study of rubber chemistry. At the conclusion of his year's study each successful applicant, who must previously have been graduated from a standard American college, agrees to enter the employ of the company providing the fellowship. Those interested should communicate with C. R. Olin, secretary of the Municipal University of Akron, Akron, Ohio.

DURABILITY OF RUBBER HEELS

The Bureau of Standards, Department of Commerce, has been conducting experiments on the durability and other properties of rubber heels, from which the following conclusions have been reached: increasing the mineral rubber used increases the strength and aging qualities; zinc oxide is the best filler for red heels; the use of reclaimed rubber probably has some effect upon the abrasive quality of the heels, although additional data must be secured on this point from service tests.

At a meeting of representatives of the Bureau of Standards and of rubber heel manufacturers in New York, February 20, the standardization of types and sizes of rubber heels was discussed. Plans are being made for definite recommendations.

The Ideal-Omnium Rubber Works, Ltd., 1940[1]

A Forecast of the Future Possibilities in Rubber Vulcanization Practiced Two Decades Hence

Dr. P. Schidrowitz

Compared with the works with which I had been familiar in the first and second decades of the nineteenth century, the exterior of the Ideal-Omnium Rubber Works, Limited, of A. D. 1940, struck me as having indeed a strange appearance. Firstly there were no chimneys. My guide, with a pitying smile, explained that there were no chimneys because they had no boilers as we knew them, and there were no boilers because no steam lines were needed. "But what," I asked, "about your mills and calenders and vulcanizers?"

"Each mill and calender," he explained, "is connected with its own small boiler; this is electrically heated and fitted with an automatic cut-out which operates when the mill or calender has attained a definite heat. Subsequently the temperature is kept steady by a stream of warm water from a central tank. The latter is heated by means of powerful electrical elements and is fitted with delicate thermostats."

"But the vulcanizers?" I hazarded.

"There is no such thing as steam curing nowadays," he replied. "The hot cure, where it is used, is run by means of hot or warm water. Our curing heats range from 120 to 160 degrees F.

The "Ideal" Vulcanizer

"You see," he added, "nearly all our molded stuff is cured in an open tank, under water. The water at the proper temperature passes through the tank in a constant stream, coming from a central tank, and is pumped back from a central well. In this way an absolutely even temperature throughout the vulcanizer is obtained, and very little heat is lost. It takes a little longer, of course, to heat up the goods this way than it would with steam, but the accelerators we use render the cure a very short one anyhow, and the advantages of working in an open vessel are enormous. No danger, no time lost in blowing off, no waste of steam, no trouble as regards overheating, and so on."

"But," I said, "I thought that with big stuff—solid tyres and so on—accelerators were not much use because of the long rise necessary in any case."

My guide adopted a slightly derisory attitude. "Solid tyres," he said; "yes, we have one or two of the old kind in the museum, but anyhow the little difficulties you experienced about goods of that kind have been overcome. You see," he added, "in your day you attempted to adapt the accelerator to works practice. Today we adapt works practice to the accelerator."

"And how," I asked, "do you heat your Waddingtons?"

"Just as we circulate hot water," he replied, "so we circulate electrically-heated hot air or inert gases—where such methods are still used. But," he went on, "we generally cure proofed goods, boots and so on, by one of the cold sulphur processes. You may know of the jelly methods, the gas cure, and the—" but at this point his answer appeared for a time to be confused.

"Ideal" Tyre-Making Methods

While this conversation was proceeding we had entered and commenced a tour of the works. In every department some radical change was obvious. The tyre-making shops, for instance, were partly fitted with curious-looking looms, partly with tyre-making machines quite unlike anything I had seen.

"In your day," my guide explained, "you were troubled, when you made fabric tyres, with the crown and skirt difficulty; in the case of 'cords' this objection was not entirely eliminated, and it was not easy to ensure even and constant tension. Your mechanical methods were either slow or only mechanical in part. They were all very costly—compared with ours—mainly because they were so slow. Tyre-making was a craft or an art, but not an exact mechanical process. I always wonder how it was that you managed to turn out such a high percentage of good tyres as you did. Now, as you see, our process is a continuous one, and the actual making of a tyre occupies no more than a few minutes. We are able to achieve these results because the design of our tyres is symmetrical and not asymmetrical. Long-fiber cotton—(the staples are 6 to 8 inches)—is converted into threads, the threads pass through a proofing bath, then through a drying chamber, and then on to be interwoven with threads of rubber. In this way a supple and thin but immensely strong cloth is produced, which is continually and symmetrically lapped around a collapsible core, and at the same time attached to a false rim. The core, which is of the air-bag type, is collapsed and withdrawn through the valve hole and the tyre is complete."

"Do you withdraw the core before curing?" I ventured.

"No," he replied, "for certain types of tyres vulcanization proceeds at the same time as the tyre is being made up. For tyres with patterned treads molding and curing under water is necessary, and the bag is withdrawn after this operation."

No Inner Tubes

"I cannot see," I said, "how you get your inner tube in or attach the tyre to the rim."

"Inner tubes," he replied, "are things of the past. Except for the small valve opening the tyre is made without a break. As for attachment, the false rim, which is part of the tyre, is attached to the rim proper by a simple locking device—that's all!"

"Ideal" Curing Shops

We now passed into a shop which was noticeable for its cleanliness and silence. It contained nothing but a series of circular, well-lagged tanks fitted with lifting gear and run-ways, and a pipe system. "Those," said my guide, "are the hot-water vulcanizers for heavy molded stuff. The molds come in along the run-ways and are then automatically seized and lifted, and lowered into the tanks. They are then locked by the internal compression gear, and the water is turned on. At the end of the cure the water is automatically turned off, pressure is released, and the goods are removed to the finishing shop by means of run-ways on the far side."

Again we passed on. I distinctly remember a very faint but characteristic smell of electioneering eggs in one shop. "Yes," said my guide, in reply to a query, "this is the rubber linoleum department. You can just see, if you look out of the window, the gas-generating station and gasometers. The process, of course, is a continuous one."

"Ideal" Boot and Shoe Making

To describe what I saw in the boot and shoe shops, the mechanical and surgical departments, the cable and sports shops, and so on, would occupy more time than I have at my disposal; but everywhere—even in the mill rooms with their enclosed mixers and silent gears—one saw or felt that curious absence of the characteristics of the 1920 factory—noise, steam, solvent vapors,

[1] Portion of a paper on, "Vulcanization: Past, Present and Future," presented at the Institution of Rubber Industry, London, January 11, 1922.

the dust of fillers. Above all there was the evidence of electric power at every turn—electric power for heating shops and for heating mills, water, gases—electric drive for every machine, for run-ways—electric light for illumination and for some kinds of curing.

"Tell me," I said to my guide, "how is it that you are able to use electricity so lavishly?"

"It costs us," he replied, "about one-sixteenth of a penny per unit. On every coal field there have been erected superpower stations, costing many millions apiece; several superstations are worked by tidal power; the loss in transmission has been reduced to a minimum."

"But the capital cost," I said, "must have been enormous; what of the consequent overhead charges?"

"Ah, yes," he replied, "but the capital cost was defrayed out of the economies effected by a drastic reduction of the Income Tax in 1922."

And then I woke up.

The Rubber Business Thirty Years Hence

A Pre-View of Conditions in 1952

An open letter from the Editor of The India Rubber World to the Institution of Rubber Industry, London, in general and to Dr. P. Schidrowitz in particular—A continuation of the record of rubber conditions in 1940[1]

THE very interesting rubber manufacturing progress as outlined by Dr. Schidrowitz would almost suggest that the industry had in 1940 reached its highest point of effectiveness. In that year things had settled down to absolute scientific manufacture. Crude rubber was produced at about the same margin of profit as sugar. Yet within one short year the whole fabric of the rubber business was thrown into a condition of chaos. In the thirteen years following undreamed-of happenings, discoveries and inventions so transformed the business as to make a new and enormously enlarged industry.

Ten-Dollar Rubber

The sudden, amazing rise in the price of crude rubber in 1941 was due to a circumstance absolutely without parallel in things industrial. It was thus. The steel rails on most of the railways took on a sudden and altogether unexplainable crystallization. They became more brittle than glass, and almost overnight. Accidents were of daily occurrence. Whole systems were crippled. Temporary wooden rails were rapidly installed but they were pitifully inadequate. It was then that the rubber manufacturers brought out the Indestructible Hard Rubber Rail. So great was the crisis that the formula for its manufacture was given to the world free. Thousands of tons of rubber were required and the price soared to $2, $5, and finally to $10 a pound. The Brazilian industry revived, and Pará and Manáos became active and more prosperous than in the days of the tire boom. Reclaimed rubber also flourished and ordinary scrap sold as high as $5 a pound. Naturally the plantation profits were immense and new companies were floated by the hundred. Mincing Lane again saw a rubber craze but multiplied a thousandfold. It looked as if the new high price had come to stay and that the rubber business as a whole would be wrecked.

The rubber production for 1940 amounted to 605,000 tons with consumption practically the same. With the tremendous use induced by the rubber rail, however, production increased enormously. Every known rubber producer was worked to the limit. The African rubber industry revived and was soon furnishing double the amount that had ever before come from the Dark Continent. Central and South America were exploited for everything that could possibly produce rubber, and hundreds of new grades appeared. Shrubs, as the *Picradenia floribunda* and *Chrysothamnus nauseosus* were gathered and the rubber extracted. Vast plantations of guayule, chrysothamnus, and asclepias were installed. The Moro Republic, comprising the southern islands in the Philippine group, started rubber plantations that rivaled those of the Malay States. The Mexican castilloa plantations started up afresh and were put on a paying basis. From natural sources the product soon rose to over a million tons a year with promise of a vast increase once the newly installed plantations became productive. For the first time in the rubber history synthetic rubber was a commercial success. In the United States nearly every reclaiming factory put in a plant and began profitable production.

Superresilient Rubber

About this time a rubber chemist who had been studying coagulation brought out the superresilient process. By the use of a new coagulant he produced a rubber of extraordinary resilience and with compounding properties that were unbelievable. As an example of its resilience an inch strip of pure rubber would stretch to fifty inches and retract thousands of times without altering its original length. In compounding also, a pound of rubber would go as far as fifty pounds made by the acetic acid or indeed any other process. Once in use this automatically adjusted supply and price and dollar rubber again ruled.

Foot-Comfort Rubber Carpets

What was apparently an invention of minor merit at first, became one of the really big things once the public discovered it. That was warm rubber carpets. It will be recalled that both rubber and linoleum are very cold to the touch. To stand barefooted upon either is like standing upon ice, while standing upon a woolen rug is thoroughly comfortable. A certain type of compounding together with a resistent surfacing, evolved rubber mats and carpets fully as comfortable as those of wool. As these could be made in colors or combinations of colors, and were both sanitary and indestructible, the sales were enormous.

Sole Leather Surpassed

The years of experimentation of rubber-leather finally resulted in a product that was so far superior to anything of animal origin that oak-tanned sole leather became a thing of the past. The sheets of sole rubber-leather were made up in plies, every alternate ply being a sheet of sponge rubber, pressed down thin and revulcanized, thus still containing minute insulating pockets. The other plies were of non-stretchable rubber made up of a fibrous compound applied in flakes, the whole finally being hydraulically pressed together and cured.

Synthetic Cotton

One of the most interesting developments, particularly to tire manufacturers, was the production of synthetic cotton. This was accomplished by one of the large tire fabric companies, and a

[1] The Ideal-Omnium Rubber Works, Ltd., of 1940. Current issue of THE INDIA RUBBER WORLD.

product arrived at that had greater strength than native cotton, but had just enough elasticity to withstand a great amount of flexing, and was absolutely unaffected by moisture.

Rubber Odor is Eliminated

Brazilian scientists in 1945 discovered an entirely new type of *Hevea brasiliensis*. In memory of the distinguished rubber scientist Dr. Jacques Huber, it was called the *Hevea hubeii*. On analysis the product was apparently the same as that of the *H. brasiliensis*. The interesting fact about the gum was, however, that the rubber smell was entirely absent, and even when burned it had no trace of odor. After vulcanization there was a slight aromatic smell which was exceedingly pleasent. The Brazilian Government at once impounded the trees, carefully guarded the seed, and installed small nurseries at Manáos and Pará, both of which were also guarded. As the trees grew, grafts were sold to rubber plantations under ironclad contract that all blossoms of the grafted trees should be destroyed as fast as they appeared. The product known as Huber rubber was eagerly bought by manufacturers of fine clothing, air goods, dress shields, etc., etc.

The Rubber Industry Decentralizes

The perfection of machines and processes for the wireless transmission of power was one of the most notable achievements in this period. Decentralization of industry had long been preached but had never been found practicable. With plenty of power transferable thousands of miles, factories could locate and operate where they would. The large companies removed from the congested centers and located in country villages, in mountain valleys, and even on the edges of the deserts. So general was this movement that in the city of Akron, Ohio, for example, at the end of 1950 only the pioneer plant remained.

Vacuum Balloons

A very curious development of sponge rubber was the sponge rubber balloon. In this the cells were very large, were hexagonal, and all of the same size. Made of a very tough compound they were vulcanized hard and protected by an air-tight outer covering. The air then being exhausted from the cells, a vacuum balloon was the result, which floated in the air as if gas filled. This of course revolutionized the toy balloon business.

Hard Rubber Wheels and Rims

In 1951 the unit molded wheel and rim appeared. It was the last word in automatic mechanical production. Like a disk wheel in shape it was formed wholly of hard rubber. By a new process of tempering and alternating expansion and compression during vulcanization a hard rubber product was obtained that had the following characteristics. The hub possessed solidity combined with an interior surface that was frictionless and unaltered by change of temperature. This formed an oilless bearing that showed no wear after millions of test revolutions. The spokes and felloe were of different compounds fitted for special stresses that they endured and were 1200 times stronger than the toughest wood. The demountable rim of still another compound was tougher than the best steel, would not crystallize and possessed a rigidity that was absolute perfection. Nor would the rim rust, the spokes loosen, or the felloe spread. A minor but interesting feature was that the wheels could be turned out any color and never needed painting as the colors ran through each part.

Crude Rubber Tanning

Experiments in making crude rubber more resistant to oils, vegetable, mineral, and animal, finally attained a measure of success that was remarkable. The process was for want of a better name called tanning. It consisted in treating crêpe, in an enclosed cracker-washer, to certain liquids for a period of several hours. The result was a greatly toughened rubber that was wholly unaffected by oil or grease. Incidentally the ordinary solvents, naphtha and benzol, had no effect upon it, not even causing it to swell. This naturally narrowed its preparation down to dry mixing. As mineral rubber and sulphur were the only ingredients added, this was no hardship. For oil and gasoline hose and packings the new rubber found instant application.

The Gas Core for Automobile Tires

In 1952 came the perfecting of the gas core that has since had such a wonderful vogue. Briefly described, it was a core of compressed air holding its form through the binding influence of a secret cohesive gas. The cores looked like shapes of vapor, were almost transparent, and of course very light. To the touch they were indescribably silky, were practically immune to heat and cold and not affected by oils or grease nor by most acids or alkalies. They were exceedingly tough and once placed in a tire casing—the inner tube being unnecessary—outlasted several casings. Nor did punctures or tears in any part of the casing materially affect them. Sunlight, however, destroyed them quickly, indeed light caused them to lose their resilience. They were made in all sizes even to giants and in full-circle or in six-inch sections. For storage and sale they were wrapped in a special rubberized paper that excluded all light. Using them on a heavy, seven-passenger Paraflex car one set ran 100,000 miles without removal and were good for many thousand more. The use of these cores in air cushions and life preservers as well as in air mattresses vastly increased these lines of manufacture.

Self-Repairing Rubber

Rubber is full of strange surprises and has no end of almost impossible characteristics but the development of actual live rubber transcended all others. A well-known experimenter instituted searching comparisons between rubber and variously colloided structures. Beginning with the muscular fiber of horses and cattle he settled down to the study of protective callouses as shown in the feet of those who go barefoot. These showed a constant cell renewal. If this could be paralleled in tire treads it would mean automatic tread repair. The production of a feeding stock solved the problem. At first it was very difficult to arrange the feed stock without injuring the cushion stocks. This was accomplished by capillaries that ran from under the side of the tread, through the cushion and carcass, to a film of feed stock on the inside. By renewing the feed stock reservoir once in about ten thousand miles, treads on tires renewed as fast as they became worn and ran 200,000 miles without apparent change.

International Association Developments

The work of the International Rubber Association reached its apogee in 1952. It will be recalled that this was the amalgamation of all rubber clubs and associations with central offices in New York and London. For years attempts had been made to apportion crude rubber according to use, both to stabilize the price and prevent speculation. This could not be accomplished until a fair division of exports of manufactured rubber goods was put in force. After a long time this was accomplished through an international committee. For countries that produced rubber goods as Germany and the United States the plan worked thus: Germany could sell to the United States for our consumption $5,000,000 worth of rubber goods, provided she purchased for domestic consumption an equal amount in return. The goods were priced by the International Valuation Committee. For countries not manufacturing in any appreciable quantity, the market was apportioned according to ability to produce, nearness to markets, former possession of market, etc., etc.

In conclusion, may I explain that the matters described above are by no means ordinary imaginings. Rather they are the direct results of crystal gazing, the medium being a globe of transparent rubber glass.

Utilization of X-Rays in Examination of Textiles[1]

Radiographic Study of Yarns and Fabrics for Tires, Mechanicals, and Other Rubber Products

THE methods outlined below are of recent introduction, developed by Reginald Truesdale and C. Hayes in the laboratory of the Dunlop Rubber Co., Limited, Birmingham, England.

In several branches of the textile industry, especially when structures are to be designed for mechanical purposes, it is essential that the effects of all processes subsequent to the manufacture of the textiles should be carefully studied before the yarn or canvas can be efficiently designed. Probably this applies to the pneumatic tire industry more than to any other. In applying radiography to the yarns and canvases the important feature of elongation is chiefly dealt with. The elongation or stretch of a canvas consists of (1) elongation due to regain or crimp, (2) stretch of the yarn.

A method involving the use of radiography has proved very satisfactory in studying the movement of certain threads through all the stages of the manufacture of tires, because the actual conditions are revealed without the necessity of cutting the fabric.

In order to obtain radiographic record of fabric construction under strain it becomes necessary to impregnate the yarn with suitable metallic salts. It was found that lead chromate precipitated on the fibers was most satisfactory for the purpose.

Fundamental Tire Fabric

The ideal fabric for tire construction is square when in the tire, that is, the number of threads per unit distance are equal, the elongation of warp and weft identical under the same load, and the warp and weft of equal tensile strength. The successive processes of calendering, spreading, cutting and tire case building to which tire fabric is subjected effect changes in the construction of the fabric.

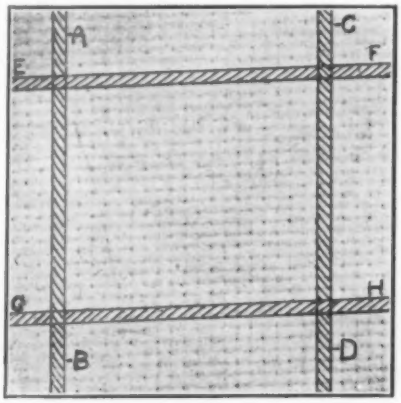


Fig. 1. Diagram for Measurement of Fabric Structure

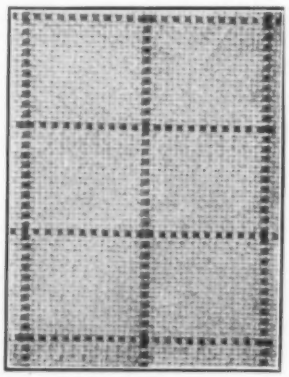


Fig. 2. Fabric Woven to Compensate Changes by Rubberizing

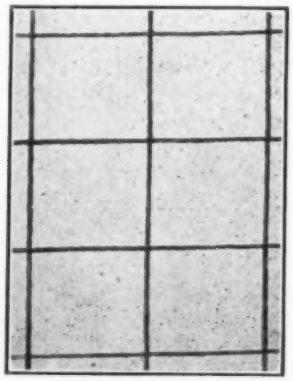


Fig. 3. Radiograph of Fabric in the Gray

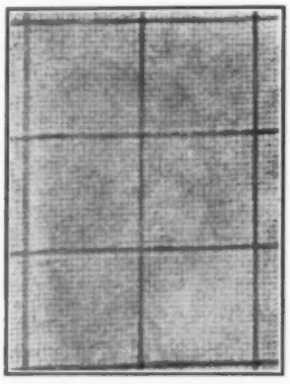


Fig. 4. Radiograph of Rubberized Fabric

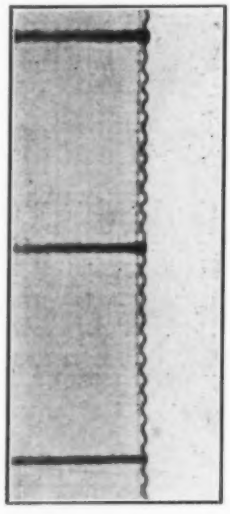


Fig. 5. Radiograph Showing Regain in the Warp

Changes in Structure

If two warp threads *AB* and *CD* or two weft threads *EF* and *GH* shown in Fig. 1 are taken, the distance between them can be measured. Any alteration in the distance between two threads may be caused by: (a) actual *stretch* of the threads, (b) alteration in *regain*.

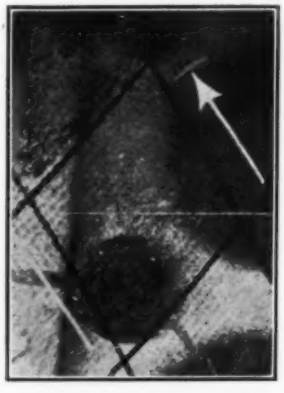


Fig. 6. Radiograph of Fabric in a Tire

[1]Journal of the Textile Institute, Volume XII, No. 11, November, 1921.

The actual *stretch* in the fabric may be caused by: (a) straightening and alinement of fibers, (b) stretch of fibers, (c) slipping of fibers.

Alteration in *regain* may be caused by: (a) unequal tensions in each set of threads, namely, warp and weft, causing decrease of regain in one set and increase in the other, (b) alteration in number of threads per unit length, (c) a flattening of the threads by compressing under tension alters the regain in both sets of threads.

It may be said that in the action of the processes up to the tire-case making process, tensions are applied to the fabric in the direction of the warp, the general effect being as tabulated below:

	Warp	Weft
Number of threads per unit length	Plus	Minus
Elongation, per cent	Minus	Plus
Regain or crimp, per cent	Minus	Plus
Tensile strength	Plus	Minus
Dry weight of fabric per square yard	Minus	Minus

Plus and minus indicate changes compared with the gray state.

When these differences have been ascertained, the fabric can be so woven that it will be square when ready for tire building. Such a fabric specially woven for X-ray purposes is shown in Fig. 2. The weaving plan was, warp and weft 20 gray and one lead chromated yarn = 21 ends and repeat. In the gray this combination did not form a square, but a rectangle, the

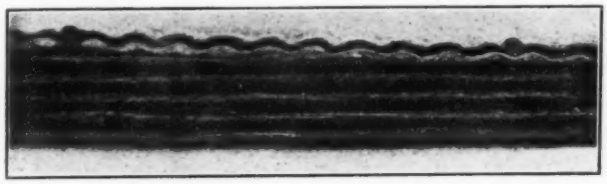


Fig. 7. Radiograph of Regain of Fabric Yarn in a Tire

ends per inch being 20.5 and the picks 23.5. Special portions of the fabric shown in Fig. 2 were marked out and indexed for radiographing after each process.

The radiographic plates were all placed in direct contact with the canvas during exposure, consequently full size reproductions of the portion exposed were obtained, shown here somewhat reduced. Figs. 3 and 4 are radiographs of the fabric in the gray and rubbered conditions, respectively, each representing a similar portion of the fabric as shown in Fig. 2. Fig. 4 shows the distinct change wrought in the fabric during the rubberizing process. The rectangles shown in Figs. 2 and 3 appear as squares in Fig. 4. Since these radiographs are contact prints their dimensions are reproductions of the fabric and the total changes that have taken place in elongation can be ascertained by measuring predetermined squares.

Having obtained the differences in stretch, it is necessary to find the changes due to alteration in regain (crimp). Fig. 5 is a radiograph showing the regain in the warp between two loaded weft threads of one square. This is obtained by bending the fabric over a straight edge, the treated thread running along the top. Either by enlarging or by lantern projecting, the regain in the yarn can easily be measured with a warping wheel. Radiographs taken after each process would give the changes due to the previous process. Having obtained the total stretch by measurement of squares, and the regain by measurement, the actual stretch of the yarn can be calculated by difference.

In X-raying a tire, the film is placed inside the tire in contact with the first ply and held in position by spring clips. The X-ray tube is on the outside, and care taken that the X-rays are normal to the plane containing the film. Fig. 6 shows one of the squares as it appeared inside the tire. In case making, the fabric plies are placed at a bias angle, and consequently the radiograph shows the former square as a rhombus. The changes in stretch can easily be measured. Fig. 7 shows the regain (crimp) in a fabric yarn when in the tire.

The changes which take place during tire manufacture are of extreme importance and before tire fabric can be efficiently designed it is necessary that the process differences should be known.

Judicial Decisions

McLAIN-HADDEN-SIMPERS CO. vs. TRENT RUBBER CO., APPEAL OF HOPE WEBBING CO. Circuit Court of Appeals, Third Circuit November 8, 1921. No. 2778.

In this case provision for approval of terms of payment by the seller was held not to continue open during the life of the contract. A sales contract for materials to be delivered during four months, a certain amount every month, "terms strictly 2 per cent cash 10 days from date of invoice or 30 days net, f. o. b., . . . application of these terms subject to the approval of [seller's] credit department," did not mean that the terms of payment were subject to the approval of the seller's credit department at will during the running of the contract, but gave a right to be exercised only before it performed by making deliveries, and credit having become an established term of the contract by proceeding thereunder, an attempt to impose new terms was an abandonment, warranting buyer's rescission.—*Federal Reporter*, Volume 275, pages 831-832.

PENNSYLVANIA RUBBER CO., vs. MILLERS, INC., Supreme Court of Rhode Island. December 7, 1921. No. 5498.

Here the distributer was held not entitled to allowances claimed for returned goods. In an action by a tire company against a distributer to recover alleged balance due, defendant was not entitled to allowances from the plaintiff for guaranteed tires returned beyond the amount credited to it by the plaintiff, where, under the contract, the final decision as to the amount of the allowance to be made in each case rested with the plaintiff, and it deemed allowances made to customers by defendant to be excessive and unwarranted.—*Atlantic Reporter*, Volume 115, pages 321-322.

Tire Company Must Use Affix to Word "Hudson"

In the matter of Hudson Tire Co., Inc., against Hudson Tire & Rubber Corporation, the plaintiff company was granted, in July, 1921, by Judge Augustus N. Hand, of the United States District Court for the Southern District of New York, an injunction during the pendency of the action. In the same court January 28, 1922, Judge Learned Hand, on the trial of the action, concurring in the views of the former judge, overruled all claims of the defendant and decided "that the plaintiff may take a decree against the use of the word 'Hudson' on tires without some distinguishing affix."

Adjudicated Patents

FRANK A. SEIBERLING vs. THE JOHN E. THROPP'S SONS CO. United States District Court, District of New Jersey. In Equity.

A suit involving an infringement of a patent for a tire-making machine and brought by Frank A. Seiberling, president and general manager of the Seiberling Rubber Co., Akron, Ohio, against The John E. Thropp's Sons Co., Trenton, New Jersey, has been decided in favor of the defendant. It is held that the process in question was anticipated by one of the old and well-known methods of making tires by hand, and consequently the bill of complaint has been dismissed.

United States Rubber Co. Appeals

The United States Rubber Co. filed on March 1 a formal appeal to the United States Circuit Court of Appeals from the decision of Judge C. Z. Luse of the United States District Court at Superior, Wisconsin, in favor of the I. T. S. Rubber Co.,

Elyria, Ohio, for alleged infringement of a rubber heel patent.

Under the decision of the United States District Court, the United States Rubber Co. will refrain entirely from the manufacture of the type of heel involved in the litigation, pending final adjudication. Only one type of heel is under scrutiny in the suit and this type has constituted only a small part of the company's rubber heel business. In the meantime the company will continue its large volume of manufacture of heels that do not involve the particular type of construction at issue in the patent case.

I. T. S. Rubber Co. Appeals in Essex Case

Following the dismissal of the suit of The I. T. S. Rubber Co., Elyria, Ohio, against the Essex Rubber Co., Trenton, New Jersey, in the United States District Court, District of Massachusetts, No. 1008, Equity, in November, 1921, for want of jurisdiction, the I. T. S. company has appealed from the decision rendered and the case is now pending.

The Obituary Record

Well-Known Mechanical Rubber Manufacturer

John J. Voorhees, president of the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey, died February 26, at his home in that city, in his seventy-fourth year. He had been ailing for about a year, but his condition was not considered serious.

He was born in 1848 in New Utrecht, New York, where his Dutch ancestors settled in 1660. At the age of sixteen he left the Erasmus School to work in a country store, soon going to Brooklyn as a clerk. In 1870 he obtained a position on the books of the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey, then a small and comparatively unknown concern. Marked energy and ability won him the secretaryship in three years and in 1877 he was elected treasurer. Four years later the president of the company gave up active work and turned over the management to Mr. Voorhees, under whose direction the business grew and prospered.

John J. Voorhees

In 1898 Mr. Voorhees terminated his connection with this firm and soon organized the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey, of which he was president until his death. Sound knowledge of the business, twenty-eight years' experience, and a wide and favorable acquaintance in the trade soon made the new company one of the leading firms in the production of mechanical rubber goods of almost every line.

Mr. Voorhees held several public offices and interested himself largely in civic affairs. At various times he was a member of the Board of Finance, a trustee of the public library, president of the Board of Education and of the Board of Trade in Jersey City. He was for a time secretary and later president of the Mechanical Rubber Manufacturers' Association, and chairman of the Mechanical Rubber Goods Manufacturers' Division of The Rubber Association of America. He was prominent in the counsels of the New Jersey Rubber Manufacturers' Association, held directorships in several local corporations, was one of the first directors of the Commercial Trust Co., of Jersey City, and until the time of his death was a member of its executive committee, and also a member of the Palisade Park Interstate Commission.

He is survived by his widow, three sons and four grand-children. Two sons, John J. and Frank D., are secretary and treasurer, respectively, of the Voorhees Rubber Manufacturing Co.

Funeral services were held in St. Paul's Church, Jersey City, and interment was made in Bayview Cemetery.

Mr. Voorhees was perhaps the most popular rubber man in New Jersey, and will be remembered by many friends and associates as a man of business shrewdness, unfailing geniality and unbounded enthusiasm.

Long Associated with Retail Rubber Trade

John W. Buckley, whose death occurred on March 3, was, as president of the J. W. Buckley Rubber Co., long associated with the rubber industry. He began, in 1872, the sale of mechanical rubber goods and fire apparatus, and his store, at 156 South street, New York, N. Y., was for 27 years an important retail trade center. In 1899 the establishment was moved to 69 Warren street, while such articles as hose, belting, packing, etc., were added to the equipment. The J. W. Buckley Rubber Co., with a capitalization of $40,000, was formed in 1910, with John W. Buckley, John H. Buckley, and Edwin W. Deane as incorporators.

NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS, INC., HOLDS ANNUAL MEETING AND BANQUET

The ninth annual meeting of the National Association of Waste Material Dealers, Inc., was held March 15 at the Hotel Astor, New York, N. Y., the meeting being called to order by Frank C. Overton, president of the association. There was a good attendance, and a general feeling of optimism prevailed, notwithstanding the fact that the industry had so recently passed through a year of very trying conditions.

After the reading of various annual reports came the appointment of officers for the ensuing year. By unanimous consent Frank C. Overton was reelected president by acclamation, and the following twelve directors chosen to serve for two years: Louis Birkenstein, H. H. Cummings, Robert Johnston, Jr., E. J. Keller, Henry Lissberger, Alex. Luria, Herman Muehlstein, John A. Murphy, Ivan Reitler, James Rosenberg, George B. Smitheman, and Clarence B. White.

At the annual meeting of the board of directors, which immediately followed, these officers were chosen: Harry R. DeGroat, 1st vice-president; James Rosenberg, 2nd vice-president; Fred Mayer, 3rd vice-president; and Charles M. Haskins, treasurer.

Special efforts will be made during the coming year to increase the membership of the association, and to make the next anniversary, the tenth, conspicuous for its actual progress in furthering the prosperity of the industry.

Ninth Annual Banquet

The association's ninth annual banquet, held on the evening of March 15, at the Hotel Astor, proved to be an unqualified success, with an attendance unexpectedly large. The speakers on this occasion were the Rev. Percy Stickney Grant, Willard Scott, and Hon. Carroll L. Beedy, congressman from Maine.

Rubber Scrap Division Meeting

At the meeting of the Rubber Scrap Division, held the day previous, N. E. Berzen was reelected chairman for the year ending March 24, 1923. Members of the division were particularly interested in the report of the Traffic Department covering the case now pending before the Interstate Commerce Commission in which a sixth-class rate has been asked for on scrap rubber.

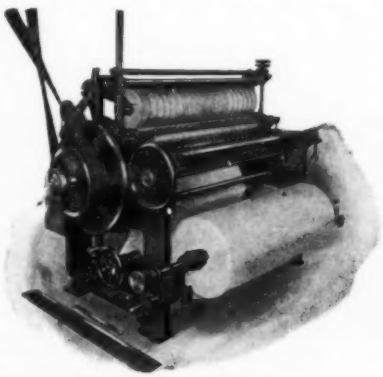
Aaron Bers, of E. Bers & Co., 10 Desbrosses street, New York, N. Y., has been appointed chairman of the Scrap Rubber Division's Grievance Committee, and N. E. Berzen will also serve in this division.

Handling Cloth Wrappers in Rubber Factories

Standardization and Proper Care of Wrappers Insures a More Smoothly-Running Organization, a Neater Shop, and a Larger Saving of Material, Time and Labor

ONE of the largest expense items in all branches of rubber manufacturing is the maintenance of cloth wrappers and liners which cover rolls of gum stock, calendered sheets, and rubberized fabric until ready for use. Any methods that can be devised to lengthen the life of these liners and reduce the volume of this expense are well worth investigating, as a tire and tube plant with a capacity of 1,000 casings and tubes per day can very easily spend $50,000 a year on this equipment.

The first step in controlling the situation is to make a survey of all the wrapper equipment, taking note of the conditions under which it is used, such as trucking facilities, storage of rolls, calender wind-up arrangements, etc., and making a list of specifications for the different kinds of wrappers, book leaves, etc. In a tire and tube plant, for example, the following groups can be classified:



Cameron Machine Co.
Slitting and Rewinding Machine

1. Heavy fabric liners for covering cord, square-woven, reinforcing, and breaker strip fabric.
2. Light-weight fabric liners for covering bead and flap stock.
3. Tread, tube, and gum-stock liners for gum stocks and strips.
4. Tire-building-machine wrappers for plies of fabric used in machine-built tires.
5. Books for cut stock—fabric, cord, breaker, intermediate, sidewall.
6. Miscellaneous small wrappers for tread covers, etc.

Slitting, Rewinding, and Stitching Machines

Many plants have found it a paying investment to centralize the control of wrappers in a small department, as a subdivision of the mill and calender departments. This department should be equipped with a wrapper slitting and rewinding machine and a stitching machine such as shown in the illustrations.

A flat-top table with a wind-up on each end is necessary for inspecting and cleaning dirty liners, and a measuring device to determine the yardage needed should be attached to it. It is a good plan to hem the ends of all liners and mark them by sewing on a strip of different color fabric. In this manner a torn wrapper can be instantly detected.

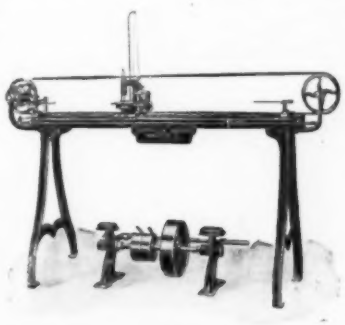
Tire Fabric Liners

Liners for tire fabrics are still a great problem to tire manufacturers, large and small. Builder fabric of all kinds, after it is frictioned and skimmed is very tacky and this fact, coupled with the weight of the rolls—600 to 700 pounds each—makes the stock stick to the liner when subjected to the slightest pressure, or if it is wound too tight. When this happens it not only spoils stock but also makes the liner useless for reuse unless it is carefully cleaned. This is a long, arduous, and expensive job at best. Large blotches of gum can be removed by soaking the under side with gasoline or naphtha, but even this leaves a light bed of gum on the wrapper which will cause it to adhere to the stock again on rerunning.

Heavy duck, 17-ounce weight, is used for these liners. In the 60 to 65-inch width, this material costs between 90 cents and $1 per running yard. To make 1,000 tires a day, nearly 7,000 yards would be required as permanent equipment, making an investment of $7,000 necessary for this item alone. If these liners are subjected to frequent cleaning they will soon wear out and become useless for the intended purpose. If their life is one year, the cost is 7 cents a tire, which is a fair apportionment.

Some plants rewind all rolls after running, which has the double advantage of allowing the stock to cool off, preventing surface cure from the action of the accelerators while the roll is racked, and avoiding adhesion to the wrapper, as cold stock will not stick as readily as the hot gum. Other manufacturers have the calenders equipped with cooling drums which lessen the danger of sticking, although cases have been known where this chilling action causes bloom to occur on certain compounds. If the one-man two-wheel truck is used to carry the rolls from the calenders to the cutting department, the stock will stick to the wrapper where the bar of the truck presses against the roll. A much more economical method is the overhead trolley system whereby the rolls are lifted from the calender wind-up in the horizontal position by a chain-hoist and sent direct to the bias cutters.

Several tire manufacturers are interested in the development of wrappers chemically-treated, not only to prolong the life of the wrappers but also to give the surface a glossy finish which will not stick to the rubber. Various combinations of oils, cellulose preparations, have been tried with some degree of success, and several concerns are putting out a liner duck in treated form. The price is about the same as untreated duck, as lighter fabric is used.



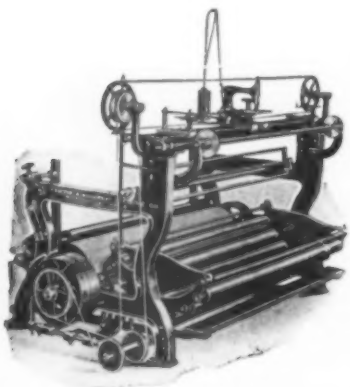
Curtis & Marble Machine Co.
Railway Stitching Machine

Types of Standard Fabrics

Preliminary liners at the calenders for receiving frictioned rolls before coating may be of lighter material such as 2.40-yard sheeting if the rolls are to be skimmed immediately after frictioning. But in large plants where a calender will run on friction one day and skim the next, it is better practice to use the regular 17-ounce wrappers. This requires practically no extra liner equipment, as with one roll of wrapper to receive the first skimmed roll, the liners can be used in rotation as they are taken off.

The purchasing agent should, if possible, buy all tire fabric in standard cuts, for example 125-yard or 150-yard rolls, so that the fabric liners can be made in standard lengths which will always be long enough for the rolls of stock. It is advisable to stencil the ends, giving date of purchase, number, length, and weight, so that accurate records can be kept of the wrapper expense.

Tube and tread stock wrappers are usually made of some variety of 3.00-yard sheeting of fine, tight weave rather than the coarse open weave. Gray goods are not satisfactory, owing to the lint which causes the gum to stick. Another bad feature is that the gage may be affected when removing the stock. Dyeing obviates the difficulty, and by using several colors for different sets of liners, such as black for treads, red for tubes, liners for various purposes can easily be distinguished. Some plants use hollands, silesia cloth, or cambric with good results, but mill practice has shown that this material does not stand up as well. These rolls should be standardized in 50- or 75-yard lengths to make it practical to operate the calenders at maximum efficiency on piece work.



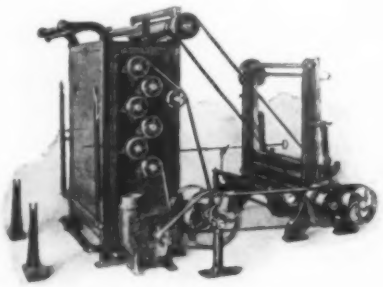
Curtis & Marble Machine Co.

Railway Sewing and Rolling Machine

Other Uses for Liners

Building-machine wrappers, about 12 inches wide, afford a good outlet for using up discarded and condemned tread and tube liners. There are bound to be some good parts which can be stripped and sewed together for the desired length. In the same manner the supply of tread-cover cloths and wrappers to cover gum stocks in the mill room can be replenished. Medium-weight cloths suitable for the leaves of stock books can also be cut from discarded liners.

In certain fields of the industry where no impairment of the quality of the finished product would result, the fabric used for processing may first be employed as liner cloth and then frictioned in rotation, thus eliminating the liner expense altogether. In tires, for flap and bead, sheeting can be employed in this manner. In mechanicals, hose and belting ducks, and footwear friction, this system can also be used to advantage, but standardization is necessary to accomplish the result successfully. In a shoe mill, for instance, all rolls of sheeting to be frictioned can, by use of the sewing machine, be made into 350-yard lengths, this measurement to be determined by the number of yards of stock which will make an even table of stock for cutting so that there will be no piecing of plies. The heaviest sheeting used should be made up into the same lengths for wrapper and after unwinding, returned to the cell drier, redried, and frictioned.



Curtis & Marble Machine Co.

Heath Vertical Brushing Machine

System is Necessary

Disciplinary measures should be taken to prevent the tearing of wrappers. If all lengths are standardized and marked and no tearing whatsoever permitted, there should be no difficulty. But if the mill practice is not systematized and the employes are permitted to tear wrappers when only half a roll of stock is used, instead of rewinding to keep the wrapper intact, the plant manager will soon find that he is unwittingly furnishing his workmen and their relatives with aprons and towels. Occasional tears in the liners are unavoidable and should be repaired immediately, otherwise they will spoil stock and ruin the wrapper.

There are other indirect results aside from material savings in the proper care and standardization of wrappers. It means a more smoothly-running organization all the way through, a neater shop, and still larger savings in time and labor.

PROGRAM, RUBBER DIVISION, AMERICAN CHEMICAL SOCIETY

The following papers will be read before the Rubber Division of the American Chemical Society at the Birmingham, Alabama, meeting, April 3 to 7:

The program, starting Wednesday morning, follows: "Internal Mixers," by R. P. Dinsmore; "The Thermal Properties of Rubber and Rubber Pigments," by Ira Williams; "Physical Properties of Rubber Compounded with Light Magnesium Carbonate"; "The Relation Between Chemical and Physical State of Cure of Rubber Vulcanized in the Presence of Certain Organic Accelerators," by Norman A. Shepard and Stanley Krall; "Physical Testing Graphs," by W. B. Wiegand; "Rubber Division Methods for Rubber Analysis," committee report and discussion. Symposium topics: "Organic Accelerators," "Specification Standards and Testing, Including Chemical and Physical Tests in Compounds."

Dr. W. C. Geer, by special request, will repeat his address as given at one of the general meetings, on "Recent Developments of the Chemistry of Rubber."

SECRETARY OF COMMERCE TO HOLD CONFERENCE WITH TRADE ASSOCIATION REPRESENTATIVES

The Secretary of Commerce will hold a conference April 12, 1922, at Washington, D. C., in the Department of Commerce Building, Room 704, with representatives of trade associations whose activities are national or interstate in scope.

This conference will be held with a view to facilitating the collection of certain statistical information, and considering the best means of bringing such information to members of trade associations and to the public.

TEXTILE CALENDAR

National Association of Cotton Manufacturers, spring convention and annual meeting, Hotel Somerset, Boston, April 26, 27 and 28, 1922.

Cotton Manufacturers' Association of North Carolina, convention, Robert E. Lee Hotel, Winston-Salem, N. C., April 27, 28 and 29, 1922.

American Cotton Manufacturers' Association, annual convention, New Willard Hotel, Washington, D. C., May 26 and 27, 1922.

Southern Textile Association, annual meeting, Oceanic Hotel, Wrightsville Beach, Wilmington, N. C., June 2 and 3, 1922.

SOME FACTS ABOUT YOUR AUTOMOBILE TIRE

In a 30 by 3½ cord tire there are 1,723 miles of cotton fiber if placed end to end. This means over 9,000,000 feet. There are 400 of these fibers to the inch, the best fiber being 1⅝ inches long. For a 35 by 5 cord tire there are 30,330,000 feet of cotton fiber, or over 5,744 miles. In the cords which make up the carcass of the cord tire there are 15 twisted strands, each cord being divided into three cables of five strands each. There are 650 inches or 18 yards of fiber in every inch of this yarn. A standard 5-inch cord tire has 20 to 26 cords per inch, eight plies or layers of these cords making up the carcass. In size one of these cords is similar to a medium-weight fishing line, while its breaking strength is approximately fifteen pounds.—Miller News Service.

A Glossary of Words and Terms Used in the Rubber Industry—XIII[1]

Pneumatic Tires—Additional Tire Fabric Definitions[2]

By Henry C. Pearson

FABRICS. Tire textiles classed according to varieties of cotton in weave and titles under which the fabric is marketed:

ARIZONA. Trade name for a tire fabric made of the white, strong, long-staple, very flexible Salt River or American-Egyptian cotton developed originally from "Sak" seed grown in Arizona, and largely of Pima grade. It is marketed as carded and combed. See Carding, Combing, Cotton, Sakellarides.

CARDED AMERICAN. Trade name of a tire fabric usually made of the better grades of the white, strong, medium-staple peeler or similar cotton grown in the Southern States, and the yarn of which has been carded but not combed. See Carding, Combing, Cotton, Peeler.

CARDED EGYPTIAN. Trade name for a tire fabric made of the somewhat brownish, strong, medium-staple cotton grown in the upper valley of the Nile, and the yarn of which has been carded but not combed. See Carding, Combing, Cotton.

CARDED PEELER. Trade name for a tire fabric made of the white, strong, medium-staple peeler or similar good quality upland cotton grown in the Southern States, and the yarn of which has been carded but not combed. See Carded American, Carding, Combing, Cotton.

COMBED EGYPTIAN. Trade name for a tire fabric made of the somewhat brownish, strong, medium-staple cotton grown in the upper valley of the Nile, and the yarn of which, in addition to being carded, has been also combed. See Carded Egyptian, Carding, Combing, Cotton.

COMBED PEELER. Trade name for a tire fabric made of the white, strong, medium-staple peeler or other good quality American upland cotton, and the yarn of which has been combed as well as carded. See Carded American, Carded Peeler, Carding, Combing, Cotton.

COMBED SAKELLARIDES. Trade name for a tire fabric made of the strong, long-staple, yellowish-white superior Egyptian cotton developed from Sea Island seeds in the upper valley of the Nile, and the yarn of which has been combed as well as carded. Also called Combed "Sak." See Carded Egyptian, Carding, Combed Egyptian, Combing, Cotton, Sea Island.

SEA ISLAND. Trade name for a tire fabric made of the strong, long-staple, white, very elastic cotton grown on islands of the coast of Georgia and South Carolina and to a less extent on the nearby mainland. It is marketed as carded and combed. See Carding, Combing, Cotton, Elasticity.

FABRIC TERMS. Terms used in spinning and in weaving and inspecting tire fabrics of cotton:

BAD START-UPS. Misweaves, often combining several defects, occasioned in beginning or resuming weaving, and often due to ill-timed shooting of a shuttle. Inconsiderable defects may be remedied, but many or extensive bad start-ups may warrant rejection of the imperfect fabric.

BEAT-UPS. Imperfections in fabric due to yarn or thread entanglement often due to a defective reed or batten striking down weft threads irregularly. See Weft.

BROKEN PICKS. Weft yarn or threads parted while being carried by the shuttle in weaving between the warp from edge to edge of the fabric. See Picks, Warp, Weft.

BROKEN THREADS. Severed threads in warp or weft, the injury being usually due to excess tension or yarn weakness in the warp, or to weakness alone in the weft, and likely to lessen fabric strength. See Warp, Weft.

CALENDER DISTORTION. A defect in frictioned or skim-coated fabric in which the weave deviates more or less from its original rectangular construction, and which may be due to irregular feeding of the fabric from the roll into the calender, by faulty timing of the calender rolls, or other causes. See Calender, Friction, Skim Coat, Square-Woven Fabric.

CARDING. A cotton spinning term referring to the process, following the rougher picking, of disentangling and collecting together fibers of all lengths and removing from them the larger foreign matter. The work is done with a card or frame carrying closely-set bent wire teeth and operated in conjunction with drums wound with a great number of needle-point wires. See Cotton.

COMBING. A cotton spinning term referring to the process in which cotton after being carded, and before being drawn into the primary thread, is passed through a machine containing many-wired comb-like contrivances which remove short fibers, neps (little knots due to fibers of irregular growth, or to the rubbing together of such fibers in ginning), and the smaller foreign particles left after carding, and giving the fibers a very clean and lustrous appearance. All cotton yarns are carded; but comparatively few are also combed. While combing is intended to add strength to cotton yarn, objection is made to it by some tire fabric makers on the ground that it destroys the spirality of the fiber and thereby greatly lessens an important quality required in yarn used for tire textiles, namely, elasticity. See Carding, Cotton, Elasticity, Tire Fabric.

CONTRACTION OF FILLING. The reduction in relative length—as indicated in crimp or bend—of the filling (weft) yarn or threads in weaving. Also the extent to which filling yarn may be shortened proportionately in interlacing it with the warp. In square-woven tire-building fabric allowance is made for 10 per cent contraction of filling, as compared with 14 per cent for warp take-up. If there is greater percentage disparity the fabric cannot function properly under strain. If take-up be much higher than contraction, the filling threads will be straightened, and may break before the warp reaches utmost stretch. See Crimp, Fabric, Filling, Take-up, Warp.

DROP END YARN. Yarn of which one or more of its component threads is broken while being wound on a paper or wood tube or cone, leaving the strand short of its required number of threads, and often causing breakage of the yarn in unwinding on a loom. Such defects are also called cobwebs. Their frequent appearance in a fabric may warrant its rejection.

[1] Continued from THE INDIA RUBBER WORLD, March 1, 1922, pages 412-414.

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Elasticity. A property of a body which enables it to resist deformation and, if deformed, to regain at once its size and shape. An inherent quality of cotton manifested when compressed as raw material or twisted into yarn, and making it peculiarly suitable for tire fabric. Elasticity is regarded as more pronounced in carded than in combed cotton, the combing process being said to greatly lessen the natural curl, spiral, or twist in the fiber, and which curl contributes greatly to its springinesss or elasticity. See Carding, Combing, Cotton.

Ends. (1) Single threads of yarn as compared with plied yarn composed of several single threads twisted together, and often called thread. (2) The warp yarn or threads in a fabric. See Warp.

Fabric Gage Variables. Deviations from standards for textile thickness which may result in damaged fabric and may justify rejection or deductions. A difference in gage in excess of .002 or .003-inch in frictioned and skim-coated fabrics may result, in tire building, in inside buckling or shy sidewalls. See Buckling, Gage, Shy Sidewalls, Specifications, Tolerances.

Fiber Percentage. The relative number of fibers in a given length of thread or yarn. The proportion of cotton filaments drawn into primary thread in spinning. See Cotton.

Floats. Defects due to warp entanglement and causing skip-weaves in warp and filler, and also leaving threads "floating" or uncaught. They usually result in a hole or thin spot in the fabric.

Hard Twist Yarn. Yarn containing more than the required number of turns to the inch. Twist to single yarn is given in the spinning frame, and to ply yarn in the twister, imparting strength in each yarn if correctly done.

Holes. Weak, partly-open places in a fabric caused by floats, or various misweaves. See Floats.

Loop Knots. Defects in fabric due to yarn or thread entanglement whereby small folds or doubles are formed and tied or knotted in weaving.

Mispicks, or Double Picks. Two weft threads (picks) woven as one, usually showing as a streak across the weave. See Picks.

Mixed Filling, or Mixed Warp. A fabric defect due to weaving into a textile, contrary to specifications, yarns used for a different kind of material, as when bobbins for warp or filling Egyptian cotton get on a loom running on Sea Island fabric; often a cause for rejection.

Moisture Content. The amount of water contained in a material. In cotton fabric it refers to moisture imparted originally in the spinning process, as in the making of wet-twisted yarns, to that absorbed in a damp atmosphere, or to water added to fabric to increase its weight and strength temporarily. Moisture in tire fabric is thoroughly expelled by heat before the material is rubberized. Maximum moisture tolerance in United States Army specifications is 5 per cent. See Tire Fabric, Specifications, Tolerances.

Off-Square. The disparity between warp and filling crimp. An American Society for Testing Materials term for the percentage of warp crimp minus the percentage of filling crimp. An allowable variation is 3 per cent over or under the specified off-square. See Crimp, Filling, Tolerances, Warp.

Oil Stains. Discolorations of yarn or fabric usually caused by machine oil, and often removed by spinners and weavers with oxalic acid or soap and water. Such stains in fabric must be made at least oil-free or rubberizing of the spots may prove defective.

Plus or Minus Thread Count. Excess or shortage in required number of threads per square inch of fabric. A. S. T. M. specifications allow a plus of but .02 ends over and a minus of but .04 per cent under specified count; and not more than one pick over and under for the filler. See Specifications.

Pulled-in Selvage. A fabric defect due to undue contraction of the edge woven on a textile to prevent unraveling. Other edging defects include loose, cut, weak, nicked or wavy selvage.

Reed Marks. Defects in fabric appearing as alternate spaces and tight-set warp threads caused by a sprung reed in a loom beating the filling irregularly into place.

Sakellarides. In trade cant "Sak," a high-grade upper Egyptian cotton much used for tire fabric; also a trade term for a fabric made of such cotton. See Combed Sakellarides, Cotton.

Slack Filling. A textile defect in which weft threads have not been given sufficient tension in weaving, leaving them to loosely interlock the warp, and usually indicated by a streak across the fabric. Sometimes a contraction trouble. See Contraction of Filling.

Slack Warp Ends. A defect in fabric in which some warp yarn or threads not being stretched uniformly with the other in series fail to grip the weft threads as tightly as the properly-extended warp threads. Sometimes the trouble is remedied by sewing in the threads. Also a take-up trouble. See Ends, Take-up, Warp, Weft.

Smashes. Weaving defects due to the shuttle failing to leave the shed on the loom and thus breaking the warp yarn.

Soft Twist Yarn. A yarn containing fewer than the required number of turns to the inch, and lacking specified strength. Compare Hard Twist Yarn.

Split End Yarn. Yarn, the ends or plies of which are split or broken in one or more places, weakening the fabric.

Take-up. The drawn-up state of a yarn or thread in a textile; the extent to which a yarn or thread is relatively shortened in weaving. Normal warp take-up in square-woven tire-building fabric is about 14 per cent, as compared with a 10 per cent contraction in the filling. If either be in excess proportion the crimp or bend in both yarns cannot uniformly reinforce each other under stretch and thus adequately withstand strain. See Contraction of Filling, Crimp, Fabric.

Tender Fabric. Fabric which has been weakened especially through the use of chemicals for removing oil stains, etc.

Thin Strip. A part of a fabric having fewer than the specified number of picks per square inch.

Uneven Fabric. A textile having as defects thin or thick places, or both, usually caused by excessive or insufficient filling, but sometimes due to defective yarn preparation.

Warp. The longitudinal element in weaving; the yarn or threads stretched in series upward or forward in a loom, and with which the weft yarn or threads are ordinarily woven at a right angle; often stouter and harder-twisted than the weft to withstand the greater tension to which textiles are lengthwise subjected in weaving or in subsequent use. Called also ends, sleys. See Ends.

Warp Knots. Tiny knobs in warp yarn or threads where broken ends or primary threads have been tied together. Fabric may be rejected if the ply-yarn knots exceed 25 per 100 yards of fabric, according to United States Army specifications. See Specifications.

WEFT. The transverse element in weaving; the yarn or threads carried by a shuttle crosswise in a loom and between the parallel warp threads and ordinarily interlocked with the warp at right angles. Called also woof, filling, picks, shoot. See Filling, Picks, Woof.

WRONG DRAWS. Warp threads which through faulty draws in the loom harness are lapped or "floated" over more than one filler thread, the defect showing as a lengthwise streak in the fabric.

YARN NUMBER. Numerical designation of yarn with regard to size or relative fineness or coarseness, the numbers up to 30 being usually regarded as coarse, from 30 to 60 medium, and from 60 upward fine yarns. Number is determined by the weight in ounces of an 840-yard skein or hank of yarn or thread.

The Why and When of Tire Inspection

Inspection Methods Will Vary in Different Plants; Rules Should Be Based on Experience and Common Sense

THE average buyer, whether he be a purchasing agent for a large manuafcturing concern or only a man with a car, knows that some tires are good and some not so good. Why? He doesn't know. His answer would be that this or that manufacturer knows more about the game. This would be correct. Yet better knowledge is not so much a scientific study of rubber and chemicals, as many think, as it is a knowledge that good tires giving service must be made with quality materials and quality workmanship.

Herein lies the secret of why some tires are better than others. It is quality; quality obtained only by rigid inspections; inspection not only of the finished casing to be sure of a perfect appearance but of every operation in the process of making the tire. Find the manufacturers who carry out the following procedure of inspection and you will find the producers of good tires.

There are four major classifications of inspection:

1. Inspection of Raw Materials.
2. Inspection of Rubber processing.
3. Inspection of Construction.
4. Inspection of Equipment.

Each of these major classifications of inspection comprises many specific inspections. A standard procedure follows.

Inspection of Raw Materials

The fabric used in the manufacture of tires should be most carefully inspected. First, to see that it is up to the specifications, as furnished the fabric manufacturer regarding ends and picks, twists, weights, off-square, bow, stretch, etc.

Second, to discover what defects, such as baggy places, knots, oily spots, tight and loose selvage, there may be so that these may be marked to be cut out before the fabric reaches the tire builders.

The crude rubber as received at the factory should be tested for its purity and curing qualities. Only by careful analysis or inspection is it possible to keep the rubber compounds standard so that a uniform product may be always assured.

The chemicals and minerals should be inspected and analyzed on receipt to be sure that they are standard and according to specification.

Inspection of Rubber Processing

Some rubbers have to be washed before being used. Previous study has determined how long it is necessary to wash these rubbers, and time limits are set. It should not be left to the workman to determine whether the impurities have been removed. After washing, the rubber must be dried at certain temperatures to drive off the moisture.

After the washed rubbers are dried they are ready for compounding with rubbers that have not required washing, and the chemicals and ingredients that are necessary in the mixture from which the goods are to be made. This operation should be most carefully inspected as well as the milling of the compound which immediately follows.

Compound recipes are figured out to the fraction of an ounce and it is vital that they be followed most closely. The milling or mixing time required for each compound must be determined by experiment and then adhered to most carefully. The rotation of the addition of each portion of the compound to the mix should always be the same. If these operations are not most carefully supervised and inspected it will be impossible to obtain tires of uniform quality.

Calendering the fabric and calendering the rubber to make cushion stocks and treads requires skilled operators and accurate inspection. Inspections covering the tension, temperature and gage should be made at the fabric calenders and records kept so that if anything later develops that seems wrong it will be possible to check the calendering conditions.

The cushion and tread stocks require inspections as to width, temperature and gage.

All stocks, as they arrive at their respective departments after leaving the calender room are again inspected before going into the tire: the fabric, at the bias-cutting machines, so that poor material which has been marked at the fabric inspection department may be cut out; material which is light or heavy in gage may be matched up so that total standard gage will prevail in all tires; poorly frictioned or skim-coated material laid aside to be hand-repaired.

The cushions and treads are again inspected for gage, width, weight and poor calender work when being cut to length.

Whether a bead wire or rubber bead core is used, each must be inspected: the former for circumference and soldering if it be a jointed wire, or for laps if it is an endless wire; the latter for length, soft or hard spots, splices, and wrapping.

Inspection of Construction

The semifinished materials having been inspected and passed, the inspections of assembly or construction follow. Here again there are four major classifications:

1. Inspection of Building.
2. Inspection of Finishing.
3. Inspection of Curing.
4. Final Inspection.

BUILDING. In building the tire carcass with plies of fabric equal tension must be obtained. This may be accomplished either by tension-regulating devices on the building machines, or by cutting the plies to such lengths that in building up the tire a fixed amount of stretch must result. Without this even tension the fabric may become strained or wrinkles develop.

Inspection of the turn up of the plies over the bead; the amount and regularity of the trim, as a saw-tooth effect is damaging; the width of the splices; the staggering of the splices so that no two come at the same place,—are all specific inspections which should be made besides general inspection as to the quality of the stock and workmanship of the man building the tire.

FINISHING. The term finishing is a misnomer unless it is understood to mean the finishing of the assembly of the fabric and cushion stocks. It is during this operation that the chafing

strips, sidewalls, top cushion, breakers and breaker cushions, treads and tread strips are added to the carcass of the tire. While each of these materials has already been inspected several times they should again be inspected here for quality. Also there should be inspections to cover the proper placing of each material, so that no air-wrinkles or foreign material are left between pieces.

CURING. The tire is now ready for the mold cure. Here there should be inspection to see that the tires are placed in the right molds and properly placed. The temperature and pressure of the presses should be constantly inspected, the condition of the molds for dirt or cracks, and the time that the molds are left under heat and pressure.

FINAL INSPECTION. Here the tire should be inspected for blemishes and blows, wrinkles or any defect which hurts the appearance of the tire or its wearing quality. A certain per cent of all tires should be inflated on a rim in this department as many defects are more quickly detected in this way.

Inspection of Equipment

The most rigid and thorough inspection system for the quality of materials and workmanship will be wasted without an equally sound system to take care of the equipment used in the manufacturing process. The gages should be constantly checked to be sure all gage alike. The tension devices on the calender and building machines, the heat controls, the weighing scales, all should be given regular inspection. The molds and cores before delivery to the production departments should be inspected by skilled mechanics to be sure dimensions are correct. If these molds and cores are not correct as designed, the product will vary widely regardless of how carefully the tire is assembled.

No fast or fixed rules of inspection can be laid down for all plants but in general such inspections as outlined above, based on experience and common sense, if followed, will insure a uniform product which can be depended upon to give equal results at all times.

Future Crude Rubber Supply Jeopardized

By G. H. Carnahan

The following is the conclusion of one who is the head of a very important American rubber company. He has just completed an exhaustive examination of rubber-producing conditions the world over. That his conclusions are sound is most apparent. Furthermore, the peril of the producer is also a danger for the manufacturer.

Forecasting future events or conditions is a precarious business, especially in these times of worldwide political and economic instability. Therefore the accompanying tabulation is submitted with such reservations as the circumstances manifestly justify. The figures are based on all the essential data our organization has been able to gather over a period of several years, plus personal study of the subject by the writer while visiting Malaysia. No accurate data is available on the vital subject of total acreage, and there is legitimate justification for difference of opinion as to the area of so-called "native" estates of less than 100 acres. If anything, the round figure we have employed exceeds the total acreage planted and still "in hand" December 31, 1920, since which date new planting has been negligible.

The fact that off grades cost the producer more than standard grades is usually overlooked.

In the item of shipping and selling expense a profit of two per cent to the importer is included, without which his important service to the industry would have to be suspended.

It is perhaps unnecessary to add that the average costs estimated for 1927 could not be realized today under full tapping conditions, this because of high costs and low production on areas that are still immature. Without reckless bark expenditure the average yield per acre in 1922 would not exceed 330 pounds.

With plantation rubber at 36 cents per pound or less the present small output of wild rubbers cannot be sustained without a subsidy or government loans, and for present purposes it may be neglected.

It is fully realized that many rubber estates have been brought to maturity at a cost of less than $336 per acre, but from the standpoint of ultimate profits it is now conceded that clean clearing and surface soil conservation more than justifies the additional expense entailed.

The outstanding conclusion to be drawn from these figures is that the American rubber manufacturer cannot reasonably expect to secure crude supplies over any extended period for less than 36 cents per pound. Political disturbance in the East or increased export taxes may result in much higher price levels.

Potential Plantation Rubber Production and Costs in 1927

Assumptions: (1) Normal or par exchange for sterling, guilders and Straits dollars; (2) Total acres in full tapping 3,000,000, of which 450,000 will be small so-called native or Chinese estates producing only 50 per cent first quality rubber; (3) Labor: Same wages as at present. This will probably be increased if full production is to be made with labor reengaged in India or Java; (4) Shipping and selling expenses (without interest charges or export tax) same as 1922, that is, 2.8 cents American currency per pound.

Producing Acres	Per Cent of Total	Lbs. Per Acre First Grades	Total Lbs. First Grades	F. O. B. Costs First Grades, Cents	Delivered Cost First Grades, Cents	Lbs. Per Acre Off Grades	Total Lbs. Off Grades	F. O. B. Costs Off Grades, Cents	Delivered Cost Off Grades, Cents	Lbs. Per Acre All Grades	Total Lbs. All Grades	Delivered Cost All Grades, Cents
450,000	15	375	168,750,000	16	18.8	75	33,750,000	18	20.8	450	202,500,000	19.13
1,050,000	35	325	341,250,000	18	20.8	75	78,750,000	20	22.8	400	420,000,000	21.17
1,050,000	35	275	288,750,000	20	22.8	75	78,750,000	22	24.8	350	367,500,000	23.23
450,000	15	120	54,000,000	24	26.8	120	54,000,000	24	26.8	240	108,000,000	26.80
3,000,000		284.25	852,750,000			81.75	245,250,000 = 22.3% of total			366	1,098,000,000 = 490,000 long tons	22.43*

*Export taxes, which vary in different countries, must be added to get the "all in" cost. Under existing law the Federated Malay States and the Straits Settlements levy 2½ per cent of the value when same is between 22.4 cents and 84 cents per pound. Thus, with rubber selling at 36 cents per pound, the present tax would be .9-cent. If current interest is added while rubber is in transit, the average "all in" cost of *all* grades would be approximately 24 cents per pound. However, 22.3 per cent of product (the off grades) sells for an average of 75 per cent of the first quality price. Thus the first or standard grades (smoked sheet and pale crêpe) would have to be sold for an average of 25.7 cents if the industry as a whole is to escape loss.

Under existing conditions it is believed that the average cost of bringing an acre of plantation rubber to a point where income meets current expenses cannot be less than $336 (600 Straits dollars or 840 guilders). If a return of 12 per cent to cover interest and amortization is necessary for a tropical agricultural venture, then 10.7 cents per pound must be added to the "all in" cost.

Therefore, if the world's demand for rubber in the years following 1927 (when maximum output from present planted areas will be reached) is to exceed 490,000 tons, the excess cannot be supplied unless there is reasonable expectation of standard grades bringing at least 36 cents per pound. If, in the meantime, prices remain around present low levels for a year or more, a very considerable portion of the present planted areas will be lost through abandonment and disease resulting from lack of attention, and the potential supply in 1927 will be correspondingly reduced.

Rubber Creations in Motion Picture Production

The Remarkable Adaptability of Rubber Theatrical Properties Has Been Developed by the Motion Picture Industry

THE rôle that rubber enacts in motion picture production is steadily increasing in importance. No other one material has such varied uses in the "property" shop of the big picture studios. From it the ingenious master of properties, or usually an assistant skilled in the art of vulcanizing, can fashion almost any "animate" or inanimate thing that the most whimsical director may order; and with the rapid development of motion picture making, the demands for the new creations in rubber are almost as varied as they are numerous. Often the "prop" man has to get a rubber manufacturer to help him construct difficult things, but he is getting more self-reliant than ever and more skilful in manipulating rubber. More liberal appropriations for rubber laboratory work are being made by the studio managers, and this is no small inducement to "props" to make more and better things of rubber.

Rubber Specialties

Among the specialties are rubber sharks with jointed jaws that attack swimmers, and octopuses with tentacles that drag down humans into the depths of the sea, whales that might have swallowed a Jonah, swordfishes that give battle, antediluvian monsters and huge surf fishes to carry mermen and mermaids. There are also rubber battle axes, maces, swords, clubs, and other weapons; rubber boilers that burst after victims are tied to them, rubber-uddered cows that yield unlimited milk, and other peculiar devices to give thrills or arouse merriment.

Rubber Masks

There is also the rubber mask that not only makes a revolutionary change in theatrical methods, but also has a decided artistic and educational value. Briefly, the process consists in repeatedly dipping a varnished plaster cast in a pure rubber solution until a sufficiently thick film has been obtained; acid curing the film, retouching with a brush dipped in rubber cement to produce wrinkles, thicken lips or other features, adding protuberances with tire dough, slitting for mouth and eyes, tinting with oil colors, and adding hair for beard, eyebrows, or wig. Zinc white or lithopone is usually mixed with the rubber solution and the flesh tints imparted with special aniline dyes. Black masks are made by adding either carbon black or drop black to the solution. As the masks are contortionable, fitting closely to the face and allowing the wearers to express a variety of emotions, they are being used to a large extent in motion pictures, and have scored hits in some of the most famous screen productions. Rubber "ghosts" of frightful mien, utilizing not only the new masks but also claw-like hands of rubber, are being featured in moving pictures.

Masks Effect Economy

Another novelty in the line of masks is a rubber covering for the face of an actor to enable him to play a double rôle without a moment's loss of time for the second make-up. The rubber mask is a molded, vulcanized article made by pressing into a hollow plaster mold two or more layers of 1/32-inch white tube or cushion stock cemented together and to which one or more layers of tread stock may be added, then vulcanizing, and afterward painting the mask in oil colors.

An actor puts on his make-up for the second rôle, dons the rubber mask and plays the first character part, turns aside, deftly removes the rubber "counterfeit presentment" and some of his costume and enacts the second rôle. Often a real economy is thus effected, one man easily doing the work of two.

Rubber Creations Lend Realism to the Movies

Rubber Dummies

A famous comedian in the films may vary his custard-pie flinging with a punch at his adversary that knocks the latter across a street. It only seems to happen. The punch is real but the punched is only a rubber dummy adroitly substituted for an actor. The dummy has a hollow, molded head vulcanized in a two-part plaster cast and the body, draped with clothes, consists merely of light calendered stock or sheet rubber built up over a light iron wire frame and cemented seams. Some inflation is given to impart contour. The chief difficulty in using the dummy is to get it to "land" like a human; it will persist in bouncing awkwardly.

A similar dummy, lacking wire reinforcement, may be substituted for a wooden figure on which hangs a suit outside an old clothes store. A tire valve having been put in the dummy, and a few yards of tubing attached, an assistant around a corner with an air pump causes a sensation by inflating the dummy until it bursts the buttons off the clothes and finally blows up entirely.

A Flexible Lamp-post

In pre-prohibition days many an old-timer found much comfort in resting against lamp-posts. In a comedy depicting life in that period a rubber lamp-post is used that is even more unsteady than the tipsy fellow who clings for support. The lower section of the post is a hollow iron casting fastened to the floor, and to the top of the casting is brazed a heavy coiled steel spring the upper end of which supports a cross bar of rubber, and a lantern. The coiled spring is covered with a tubular section of rubber that had been made of tread stock vulcanized about a slightly tapering mandrel after being well taped. The rubber sheath is cut from top to bottom on one side and after being set about the coiled spring, it is cemented and bound until the joint is secure. Space between the lower part of the spring and the sheath is easily taken up by rag-wrapping the spring. The lantern is merely a light metal frame to which the thinnest dental sheet rubber is cemented and inside the "glass" an incandescent lamp affords just enough light for comedy needs. A lamp lighter never troubles himself to climb the "iron" column when he can more readily bend it down. A screen Samson easily awes the unsophisticated by twisting and untwisting the post at will.

Properties That Deceive

Sometimes a Samson will bite a pistol thrust at him, when it is rubber, or lift a quarter-ton weight with one finger only to let it fall inadvertently and have it bounce, because it is but smooth-surfaced sponge rubber. Or a victim may be scared by having a 500-pound weight suspended by a cord over his head and his tormentors will apply a lighted match to the cord, causing the weight to bump him much less than he feared.

An ingenious use of mechanical sponge rubber is that of steaks, chops, roasts, etc., artfully shaped, well vulcanized, and painted in oil colors. Imperforable and unsliceable with ordinary cutlery, they are even more so with the knives and forks made for droll actors out of thin metal strips, rubber covered and with

Underwood & Underwood, N. Y.

Will Rogers—Rubber Shark Tamer

blades or tines painted in steel color. From sponge rubber are also modeled hideous Gila monsters and strings of fish, as well as bats, birds, and "savage" beasts that may be roughly handled without retaliating.

By cementing together two sides of a fish that have been cut from thin inner tube stock and painted, and by utilizing a concealed air valve and a small pump, a finny trophy can be produced that will grow in size with the fisherman's boasts.

Terrors That Materialize Not

A culprit is led by a tormentor dressed like Mephistopheles into a torture chamber and, prodded with tridents, is forced to jump barefooted from a gallery down upon a floor of "red hot" iron covered with spikes. The tridents have rubber prongs, the "red heat" is only red light, and the spikes are soft rubber points vulcanized on calendered stock.

Grim-visored knights on gaily-caparisoned steeds may wage lively battle in the movies, but casualties are rare as the pikes, lances, and halberds used in war or tourney have only solid rubber or thin metal covered with rubber on the business end. Very ornamental halberds may be made by cutting the "metal" part from heavy sheet stock, using a pasteboard model, and curing them between two metal plates in a steam press. After vulcanizing the edges are skived and the whole painted to resemble steel. Spear heads may be made in the same way, or be reinforced with a thin sheet-iron plate. This plate when steeped in blue vitriol, that is sulphate of copper, acquires a coating of the latter metal and, with pieces of fairly high-grade compounded stock on either side, is placed in a two-part mold with an iron socket and cured, the sulphur in the compound uniting with the copper and forming the strongest kind of a bond.

With but a little variation in the process mentioned, swords, long knives, daggers, cleavers, tomahawks and similar articles are made for the movies. Other queer things of rubber include dummy hands and arms, "gold nuggets" that bounce, and coat and hat racks upon which nothing can be hung. Without rubber many highly amusing motion pictures would be impossible.

Rubber Goods Exports From the United States During 1921

In a review of this country's exports of rubber goods during 1921, it is to be expected that figures will show, as they do in other industries, a decided falling-off as compared with the record-breaking year 1920. The statistics for last year, however, are of great interest as showing the steady development of our commerce with our immediate neighbors, particularly Mexico and, to some extent, Cuba. For instance, Mexico, in 1921, was second only to England as a customer for our automobile casings, while the amount expended, $1,173,826, surpassed even the corresponding valuation for this country in 1920, $1,155,833. It is worthy of note that in 1920 Mexico stood only fifteenth on this list, so that the advance in the following year is the more remarkable.

Mexico in 1921 also led all other countries at $386,560 in the purchase of shoes, followed by Cuba $304,626, and the Philippine Islands, $302,904. Mexico in 1921 also paid $86,984 for soles and heels, and was outstripped only by Cuba, at $99,627. Again Mexico was far in advance of other countries in her demand for belting, $254,872; hose, $486,219, and packing, $213,178; with British South Africa a poor second, paying $214,893 and $208,564 for belting and hose, respectively. Peru here is third on the list, in her purchase of belting, valued at $103,049. In all these instances, excluding Mexico's imports of automobile casings, shoes, soles and heels, the values of our exports are less than for 1920 with the single exception of Peru, whose just-mentioned imports of belting more than doubled those for 1920, estimated at only $46,019.

Canada also holds a leading place in connection with our exports. In the various manufactures of rubber not included in the usual classifications Canada stood first in 1921, with a valuation of $1,144,831, a decline however as compared with 1920, $2,365,412. In our exports of boots Canada in 1921 purchased goods worth $70,315, followed by other neighbors, Newfoundland and Labrador, $62,886. Here however Japan passed all other countries, buying boots estimated at $235,655, while her imports of shoes from this country, valued at $259,199, make her fourth on the list for this particular line.

Argentina and Brazil bought from us, in 1920, tire casings valued at $2,792,808 and $1,647,066 respectively, and purchased only $739,306 and $211,553 worth in 1921.

A decline in our exports of rubber goods to Europe, Asia, Africa and Oceania for 1921 as compared with 1920 is also apparent. England continued our best customer for tire casings—$2,969,245, a falling-off here from $3,712,987 of the previous year, and bought from us also more inner tubes than the other countries—$238,438 in 1921, $349,772 in 1920. Druggists' rubber sundries, too, found the best market in England—$210,575 for 1921, $223,725 in 1920.

France, who in 1920 bought tire casings valued at $2,218,026, expended for this purpose only $380,985 in 1921. For this class of goods Belgium, too, spent only $63,582 in 1921, as compared with $1,139,526 in the previous year. Sweden, buying casings in 1920, valued $2,260,929, and Spain $1,625,384, paid, in 1921, only $510,247 and $270,782, respectively.

Leading markets in Asia for United States tire casings were: Dutch East Indies buying in 1921 goods valued at $374,573, as compared with $1,143,205 in 1920; and Straits Settlements, $63,251 in 1921, $971,762 in 1920.

Australia, New Zealand, and the Philippines, in 1920 respectively paying $1,304,950, $1,949,089 and $1,941,201 for casings, spent in 1921 only $224,731, $542,145 and $445,726. British West Africa bought casings valued at $1,540,192 in 1920, while the expenditure for this purpose in 1921 was only $132,908. Detailed statistics regarding exports to all countries will be published later.

New Trade Publications

AN ARTISTIC LITTLE BROCHURE ILLUSTRATED IN MOST ATTRACTIVE colors and entitled "Hydro-United Toron Fabric Tires," has been prepared by the Hydro-United Tire Co., Department 85, Chicago, Illinois. The distinguishing features of Hydro-Toron tires are described and the reasons given for the unusual durability of this company's product, which includes "Speedway" and "Hydro-Toron Super-Size" tires.

UNDER THE TITLE, "QUESTIONS AND ANSWERS ON THE VULCANIZING, Repair and Sale of Pneumatic Tires," a comprehensive booklet has been lately reprinted through courtesy of The Miller Rubber Co., Akron, Ohio, by R. G. Haskins Co., 27 South Desplaines street, Chicago, Illinois, manufacturer of rubber-buffing equipment.

"THE GOODYEAR MANUAL OF TIRE REPAIRING," ISSUED BY THE Goodyear Tire & Rubber Co., Akron, Ohio, is an attractive and well-illustrated booklet, which should prove invaluable to the tire repairman. In this publication are given explicit directions in regard to retreading, sectional and tube repairing, vulcanizing, etc., while there are many practical suggestions for the man who contemplates opening a repair shop. The manual has a useful index.

The Editor's Book Table

"TIMES OF CEYLON GREEN BOOK, A DIRECTORY OF CEYLON." Second Edition. Times of Ceylon Co., Limited, Colombo, Ceylon. Cloth, 1318 pages, 5 by 7½ inches.

Apparently a detailed and very comprehensive list of the industries of the island of Ceylon is supplied in this second edition for 1922 of the "Times of Ceylon Green Book," published by the Times of Ceylon Co., Limited, Times Buildings, Colombo. Under such headings as "Mercantile and Trade Institutions," "Estates and Companies," "General Information," etc., much interesting data will be found, with a great deal that particularly concerns the rubber industry. A statistical table and graph illustrating the quantity and value of Ceylon's rubber exports during the last twelve years, with brief accounts, alphabetically arranged, of the island's rubber plantations, are items of special value.

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into Bolivia, Uruguay, and British, Dutch and French Guiana." Five separate monographs prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 8 by 9 inches.

In these five monographs some interesting facts are supplied concerning the rubber industry in the countries mentioned, with brief items also regarding living conditions, general manufactures, etc. In regard to the rubber trade in particular, British Guiana leads, followed in order of importance by French and Dutch Guiana. A considerable amount of crude balata is produced and exported by both British and Dutch Guiana, while their imports of rubber manufactures for 1921 show a decided increase over those for the year 1914.

"EXPORT TRADE DIRECTORY." COMPILED UNDER THE SUPERvision of B. Olney Hough, editor of *American Exporter*. Seventh Edition, 1921-22. Johnston Export Publishing Co., New York, N. Y. Cloth, 1,036 pages, 6 by 9 inches.

The publication of a seventh edition of the 1921-22 "Export Trade Directory" is indicative of the value of this well-known volume of reference, which for twelve years has continued to supply so much reliable and up-to-date information regarding this country's export trade. Under its twelve leading divisions many items, with comprehensive data of interest to exporters, appear, while the names of export merchants themselves are classified in several different ways. Finally a general index of names includes many firms that otherwise might possibly be overlooked. A map of lower New York City, indicating the principal buildings occupied by exporters, is an interesting feature of this important volume.

"FUNDAMENTALS OF COST AND PROFIT CALCULATION." BY Robert S. Denham, chief engineer and president of The Denham Cost-finding Co., cost engineer, Cleveland, Ohio. Cost Engineer Publishing Co., Cleveland, Ohio. Second Edition. Cloth, 124 pages, 5 by 7½ inches.

In this little volume the author attempts to discuss the vital elements of business, and to set before the reader some of the modern methods which are applicable to prevalent conditions. In chapters headed "The Philosophy of Cost and Profit," "Economic Expenses," "Determining Cost," etc., some interesting and practical ideas are suggested, while in the chapter entitled, "The Terminology of Cost Engineering," are some excellent definitions. The book is well indexed.

"DIRECTORY OF MASSACHUSETTS MANUFACTURERS." FIRST Biennial Edition. Sampson & Murdock Co., Boston, Massachusetts. Flexible cloth, 674 pages, 5¾ by 9 inches.

At the suggestion and under the editorial direction of the Associated Industries of Massachusetts, an organization of manufacturers engaged in every branch of industry in that state, the Sampson & Murdock Co. has published what is undoubtedly the most complete and authentic directory of Massachusetts industries ever issued.

The volume comprises four sections, distinguishable at a glance by differences in the color of the paper used for each. Firms are listed alphabetically by name, geographically by towns, and by classified products. In the alphabetical section appears the proprietor's, corporate or partnership name; name of partners, or officers and directors; capital, products, location, etc. This handy volume cannot fail to prove of the utmost value to buyers and sellers in every line.

"TECHNOLOGIE DER KAUTSCHUKWAREN." BY KURT GOTTLOB. Bolley's Chemical Technology Series, Volume 10, edited by Dr. C. Engler. F. Vieweg & Son, Braunschweig, Germany, 1915. Paper, Illustrated, 256 pages, 6½ by 10 inches.

The introductory chapter deals concisely with the chemistry of natural rubber, its source, colloidal nature, solubility, modifications, etc. The book is divided into two parts of which the first is devoted to the following topics:

Obtaining raw rubber from latex; washing and drying; resins, proteins and viscosity; analysis of caoutchouc milling, compounding ingredients, mixing and calendering; methods and chemistry of vulcanization; kinds of vulcanizers; analysis and testing of vulcanized rubber; synthetic rubber.

Part two discusses the technology of special lines of rubber manufacture including cut sheets, seamless or dipped goods; mechanical rubber goods; rings, washers and tubed products; rubber heels; rubber dolls, balls, and toys; rubberized or proofed fabrics; solid truck tires; rubber shoe manufacture and hard rubber goods. There is an index of names and authors and a subject index.

Presumably this book represents the current rubber manufacturing practice in Germany and in so far is interesting. The author entirely omits the manufacture of pneumatic tires and inner tubes which is the leading feature of the world's rubber industry, if not in Germany.

"NOMINATIEVE STATISTIEK DER RUBBERONDERNEMINGEN IN Nederlandsch-Indië (Statistics of Rubber Estates in Netherland Indies), 1921." Published by the Naamlooze Vennootschap Nederlandsch-Indisch Rubbertijdschrift, Buitenzorg, Java. Board covers, 61 pages.

Encouraged by the success of the "Statistics of Rubber Estates in the Netherland Indies for 1920," the publishers have collected and issued the figures for 1921. The estates are grouped under the various districts or residencies of the different islands in Dutch possession. The data for each estate cover the name of the estate, the name of the manager, address, planted area, area planted with Hevea, area planted with Ficus, area in bearing, output in 1919, 1920 and the estimated output of 1921; dividend for 1918 and 1919, capital, name of owner, and attorney in the Netherland East Indies. To avoid undue repetition, index figures, which are explained in Dutch and English on a loose

card, take the place of the above headings. There are also special recapitulary tables giving the number of estates, areas and yields, for each district or residency in Java and the outer possessions, and a general table giving the total figures for all the Netherland East Indies. Besides the card already mentioned, there is an alphabetical index of estates to help to make reference easy.

Vulcanization Tests on Hexamethylene Tetramine

By C. S. Williams[1]

The following experiments were conducted in order to ascertain the physical properties of cured rubber when varying quantities of hexamethylene tetramine are added to a formula in which varying quantities of sulphur are used. The basic formula was as follows: smoked sheet 100; zinc oxide 3.

To this formula were added 1.5, 3.0, 5.0, and 7.0 per cent of sulphur based on the rubber content and to each of the stocks containing these different percentages of sulphur were added 0.50, 0.75, 1.00, and 1.25 per cent of finely pulverized hexamethylene tetramine calculated on the same basis.

When using 3 per cent sulphur an excellent stock was produced in 90 minutes using 0.5 per cent hexamethylene tetramine. A better stock was produced in the same time with 0.75 per cent hexamethylene tetramine and a still better stock was obtained in the same time using 1.0 per cent. No benefit was obtained by using larger quantities of accelerator.

When 5.0 and 7.0 per cent sulphur were used the optimum cure was produced in 40 minutes in the presence of 1.0 per cent hexamethylene tetramine.

Summarizing these results it is apparent that in general one

Formula: 400 Rubber, 3 Zinc Oxide; 50 Pounds Steam Pressure (298° F. or 148° C.)

CONTROL—NO ACCELERATOR

	1½ Per Cent Sulphur					3 Per Cent Sulphur				5 Per Cent Sulphur				7 Per Cent Sulphur			
Cure, minutes						180	210	240	300	150	180	210	....	90	120	135	....
Elongation	No test made due to long cure required.					810	870	870	840	860	870	810	....	840	810	760	....
Set per cent						13	14	17	17	16	16	16	....	19	21	17	....
Tensile						1115	1258	1326	1320	2387	2614	2154	....	2110	2315	1927	....
	½ PER CENT HEXA																
Cure, minutes	....	....	75	120	150	60	90	120	150	45	60	90	....	40	45	60	75
Elongation	....	....	820	870	850	800	770	870	770	730	730	680	....	790	790	730	450
Set per cent	....	....	12	15	13	13	14	16	14	14	21	24	....	20	25	27	11
Tensile	....	....	1556	**2138**	1518	2445	**3066**	1430	909	3063	3526	3340	....	2736	3003	3008	1243
	¾ PER CENT HEXA																
Cure, minutes	30	50	75	120	150	60	90	120	150	45	60	90	....	35	40	45	60
Elongation	890	950	850	890	920	730	740	820	800	750	660	640	....	790	780	730	670
Set per cent	18	17	14	14	13	16	20	13	13	13	24	22	....	22	25	24	24
Tensile	1306	**2279**	1654	1859	1739	2949	**3197**	1584	1142	3131	3684	3153	....	3210	3284	3083	2931
	1 PER CENT HEXA																
Cure, minutes	....	50	75	120	150	60	90	120	150	30	40	45	60	35	40	45	60
Elongation	....	810	840	890	910	750	710	860	790	680	650	750	620	770	800	760	470
Set per cent	....	18	15	16	14	15	17	17	13	10	14	14	23	27	29	30	11
Tensile	....	2000	2092	2054	1735	3290	**3616**	1764	1270	2446	**3890**	3398	3262	3585	**3755**	3566	1205
	1¼ PER CENT HEXA																
Cure, minutes	....	50	75	120	150	45	60	75	90	30	40	45	60	30	35	40	60
Elongation	....	....	850	920	940	790	770	780	760	760	680	680	620	770	760	700	590
Set per cent	....	....	13	15	16	20	20	23	20	10	18	16	22	27	30	32	18
Tensile	....	....	2042	2088	**1850**	2576	2968	3235	2833	**2609**	3627	3632	3342	3540	3620	3268	1920

NOTE.—Bold face figures indicate stocks referred to in the summary.

It will be seen that with the above combinations there were twenty stocks varying from low sulphur and no hexamethylene tetramine to high sulphur and high hexamethylene tetramine.

These stocks were made up from a single lot of rubber and precautions taken to have the conditions constant. After milling they were cured in a steam press at 298 degrees F. for varying lengths of time and the cures so selected that products ranging from decided undercure to overcure would result. The accompanying table shows the results from slightly undercure to, or just beyond, the optimum cure. No cure was made, however, for the stock containing 1½ parts sulphur with no accelerator added.

After vulcanization the cured slabs were cut with a ⅛-inch die and tested in a Scott testing machine running at 20 inches per minute. The tensile was recorded in pounds per square inch, the elongation in per cent and the permanent elongation or set measured two minutes after the break also in per cent.

Conclusions

In the stock containing 1.5 per cent of sulphur a fair cure was obtained using 0.5 per cent hexamethylene tetramine when cured two hours. A slightly better stock was obtained by the addition of 0.75 per cent hexamethylene tetramine and curing 50 minutes. Additional hexamethylene tetramine had no beneficial effect.

[1]Perth Amboy Chemical Works, Perth Amboy, N. J.

per cent hexamethylene tetramine is the most satisfactory quantity to use for the stock containing 3 per cent or more of sulphur. It is also evident that only fair stocks may be produced with less than 3 per cent of sulphur regardless of the quantity of hexamethylene tetramine used.

RUBBER BALL VARNISH

A flexible varnish designed for coating rubber balls, and which is said to be not injurious to the rubber, is being manufactured by the Irvington Varnish & Insulator Co., Irvington, New Jersey. Unlike other substances of the kind this varnish forms a smooth, glossy film which adheres firmly to the rubber surface and does not crack or peel when the rubber is bent. The manufacturer claims that this product will not lose its flexibility.

METRIC CLINCHER TIRE MOST POPULAR IN FRANCE

Consuls, stationed in various districts of France, unite in saying that the clincher type of automobile tire is undoubtedly preferred in their section of that country. French makes of tires are said to predominate, followed by British and American in the order named. There are, according to recent statistics, 156,872 passenger automobile in France, and 79,076 commercial vehicles.

What the Rubber Chemists Are Doing

Determination of True Free Sulphur and True Coefficient of Vulcanization in Vulcanized Rubber—II[1]

By W. J. Kelly[2]

IN a previous paper,[3] it was shown that the sulphur present in vulcanized pure gum stocks could be divided into four parts as follows:

A. Sulphur soluble in acetone: (1) true free sulphur; (2) combined with resins and proteins.
B. Sulphur insoluble in acetone: (1) combined with rubber; (2) combined with resins and proteins.

It is evident that this classification applies only to pure gum stocks and that if compounded stocks are analyzed there will be more classes in B, while A will remain the same. If basic inorganic substances such as ZnO and PbO are present there is always some metallic sulphide formed. All the organic accelerators react with sulphur during the cure, giving rise to new bodies which may or may not be soluble in acetone.

The acetone-soluble compounds will not interfere in any way with the procedure described in the previous paper, but in the case of the insoluble part an amplified classification is necessary. The following outline will account for all of the sulphur in compounded stocks with the exception of those containing insoluble sulphates, such as those of barium, calcium, or lead.

A. Soluble in acetone: (1) true free sulphur; (2) combined with resins, proteins, and accelerators.
B. Insoluble in acetone: (1) combined with rubber; (2) combined with resins, proteins, and accelerators; (3) as metallic sulphides.

It is evident that the acetone-insoluble sulphur combined with resins, proteins, and accelerators may be subdivided according to the means employed for its removal from the rubber. Treatment with alcoholic potassium hydroxide will remove at least part of the resin compounds and also render the proteins soluble by hydrolysis. The accelerators and compounds formed from them during the cure will also be more or less affected by the alcoholic potash, and especially by the ether-hydrochloric acid which is used to evolve hydrogen sulphide from the metallic sulphides.

According to Bedford and Scott[4] and Bruni and Romani,[5] the accelerators form mercapto and polysulphide compounds during the cure. These will all be decomposed or rendered soluble by the alcoholic potash and ether-hydrochloric acid treatments, and the sulphur which they contain will be removed. Hence sulphur combined with resins, proteins, and accelerators may be divided into two parts, one of which is soluble in alcoholic potash and the other in ether-hydrochloric acid.

Analytical Procedure

METHODS OF OXIDATION

The method proposed by Kratz, Flower and Coolidge[6] gave the best results, especially with rubbers containing large amounts of organic matter. The sample was oxidized with a mixture of nitric acid and zinc nitrate, followed by bromine and potassium chlorate, and the solution was evaporated and baked. This method was used in the determination of total and combined sulphur. The free sulphur, total acetone-insoluble sulphur, and ether-hydrochloric acid-soluble sulphur were oxidized with fuming nitric acid-bromine mixture. The hydrogen sulphide evolved by ether-hydrochloric acid was collected and oxidized in potassium bromide-bromine solution, and the oxidation was completed with nitric acid. The alcoholic potash extract was oxidized, first with potassium bromide-bromine, then with nitric acid, in order to avoid adding the acid to solid potassium hydroxide.

OXIDIZING SOLUTIONS

Nitric acid-zinc nitrate was made up by dissolving 16 g. of chemically pure zinc in concentrated nitric acid and diluting to 100 cc. with the acid.

Fuming nitric acid was saturated with liquid bromine by shaking the two together.

The potassium bromide-bromine solution contained 12 g. of bromide and 16 g. of bromine per 100 cc.

TOTAL SULPHUR

A 0.5-g. sample was treated with 20 to 25 cc. of nitric acid-zinc nitrate solution, care being taken that the sample was kept cool until it was all dissolved; otherwise it was likely to catch fire. Ten cc. of the fuming nitric acid-bromine mixture was added to the solution, which was heated till all the bromine was evolved. About 0.5-g. of potassium chlorate was then added and the solution was evaporated to dryness. The flask was then heated to a dull red heat over a free flame, until the zinc nitrate had entirely decomposed and all the organic matter had oxidized. After cooling the flask, its contents were dissolved in hydrochloric acid and diluted, and the sulphur was precipitated and weighed as barium sulphate.

ACETONE-SOLUBLE

TOTAL. A 0.5-1.0-g. sample was extracted over night with acetone and the solvent evaporated. The entire residue was oxidized with nitric acid-bromine mixture, followed by potassium chlorate. The solution was evaporated twice with a few cc. of hydrochloric acid to remove the nitric acid, dissolved in hydrochloric acid, filtered if necessary, and the sulphur precipitated and weighed as barium sulphate.

TRUE FREE SULPHUR. Another 0.5-1.0-g. sample was extracted with acetone and the solvent distilled off until only about 5 cc. was left. The residue was evaporated in an oven at a temperature not exceeding 60 degrees C. The true free sulphur was separated from the organic material present by treatment with alcohol saturated with sulphur, as described in the earlier paper.

The difference between the two determinations gave the organically combined, acetone-soluble sulphur.

ACETONE-INSOLUBLE SULPHUR

TOTAL. This was determined on a sample previously extracted with acetone. The oxidation and precipitation were carried out in exactly the same way as for total sulphur.

SULPHUR COMBINED WITH RESINS, ETC., SOLUBLE IN ALCOHOLIC POTASH. The sample previously extracted with acetone was boiled for 8 hours in a 5 per cent alcoholic potash solution, after which the solution was poured off and the rubber washed three or four times with alcohol. It was next extracted over night in an underwriter's apparatus with 95 per cent alcohol, in order to remove all the alkaline solution. The two solutions were combined and evaporated, and the residue was oxidized with 10 cc. of potassium bromide-bromine solution, followed by nitric acid. After the removal of any silica produced by the action of the potash on the glass, the sulphur was precipitated as barium sulphate.

METALLIC SULPHIDE. The method used to evolve hydrogen sulphide from the metallic sulphides present was a modification of that proposed by Stevens, who treated the sample with a mixture of aqueous hydrochloric acid and ether. Owing to the fact that ether penetrated very rapidly into the rubber, a solution of dry hydrochloric acid in ether was used. After extraction

[1] Presented before the Rubber Division at the 62nd meeting of the American Chemical Society, New York, N. Y., September, 1921.
[2] Research chemist, research laboratories, The Goodyear Tire & Rubber Co., Akron, Ohio.
[3] Journal of Industrial and Engineering Chemistry, 12, 1920, 875.
[4] Ibid., 13, 1921, 125.
[5] The India-Rubber Journal, 62, 1921, 63.
[6] The India Rubber World, March 1, 1920, 356.

with acetone and alcoholic potash, the sample was treated with 50 cc. of ether-hydrochloric acid in a flask fitted with a separatory funnel and a delivery tube, and the hydrogen sulphide evolved was collected in potassium bromide-bromine solution. The last traces of hydrogen sulphide were removed by distilling over about half the ether. The bromide-bromine solution was treated with nitric acid, and the sulphur precipitated and weighed as barium sulphate.

Combined with Accelerators, Etc., Soluble in Ether-HCl. The sample which had been treated with ether-hydrochloric acid was washed several times with ether, and the solvent was evaporated. The residue was oxidized with nitric acid-bromine and the sulphur determined as barium sulphate.

Combined with Rubber. The sample which had been extracted successively with acetone, alcoholic potash, and ether-hydrochloric acid was finally treated exactly as described for the total sulphur.

Discussion of Results

The experimental results obtained show beyond doubt that there is, in the acetone extract, a considerable amount of sulphur which is combined with organic matter. This sulphur is not available for further vulcanization as such, but in the light of Bedford and Scott's work the compounds thus formed may very well be a part of the natural accelerator of the rubber.

The classification of acetone-insoluble sulphur into four parts is susceptible of expansion, for in the case of some of the accelerators it is not at all certain that their sulphur reaction products can be entirely removed by the methods described. It is certain, however, that a large amount of sulphur, heretofore considered as combined with the rubber, has been removed by means which leave no doubt as to the fact that it was not combined with the rubber.

It is of course well known that both alcoholic potash and ether-hydrochloric acid have been used before in rubber analysis, but the analysis of the extracts for sulphur has not been made.

No series of cures have been analyzed according to these methods, but their value as a means of throwing light on the mechanism of vulcanization is indicated.

The Relation Between Coefficient of Vulcanization and Mechanical Properties of Vulcanized Rubber[1]

By O. de Vries[2]

Our scientific knowledge of rubber and its vulcanization is still so deficient that even a number of the most fundamental points on which rubber testing should be based are insufficiently cleared up. For instance, it still forms a point of discussion whether the mechanical properties or the coefficient of vulcanization are the most important in judging the state of cure of vulcanized rubber. Some argue that the mechanical properties of the vulcanized article are the only ones that interest the buyer, while he is indifferent as to how much sulphur has combined with the rubber to reach the degree of elasticity and strength that suits his purpose. Others point out that the mechanical properties are not constant in a colloid like rubber, while the coefficient of vulcanization is not changed by mechanical treatment and is also independent of aging—or at least nearly so at ordinary temperatures—so that in general the coefficient is a better indication of the state of cure to which the rubber was originally brought.

Discussion on this point may well rest till sufficient experimental material has been gathered to clear it up definitely; elsewhere[3] we have summarized the present situation as follows: "As the determination of the coefficient of vulcanization means a considerable amount of additional work, and gives no actual gain in the routine of our testing of estate samples, we have not included it in our regular tests," and further, "When one wants to gain as complete an insight as possible into the properties of so complicated a substance as vulcanized rubber, both coefficient of vulcanization and mechanical properties have to be taken into consideration."

Effect of Added Accelerators on Coefficient of Vulcanization

From the latter standpoint, one of the first subjects for further research is the difference in coefficient of vulcanization for different types of rubber, cured to the same mechanical properties (position of the stress-strain curve). It has been remarked by many investigators that, when curing to a fixed cure as judged by the stress-strain curve, the coefficient of vulcanization may vary over a rather wide range.

Effect of Natural Accelerators

The accelerators increase the rate of cure enormously, and at the same time the coefficient for given mechanical properties decreases markedly. This may be explained in several ways. The organic accelerators may have a stronger accelerating effect on the processes that alter the mechanical properties than on the combining of the rubber with sulphur. Or, the very short time during which the rubber is exposed to the high temperature of vulcanization may avoid the disintegrating effect of heat (which is opposite to the stiffening effect of vulcanization). Be this as it may, if powerful organic accelerators give such a marked difference in the coefficient of vulcanization for a fixed curve, the question arises, what may be the effect of the so-called natural accelerators in plantation rubber? These accelerators are either constituents of the latex as it comes from the tree, or decomposition products formed from the non-rubber constituents during preparation. They are supposed to be amines or amino acids, and are undoubtedly very powerful accelerators, since they give a marked increase in rate of cure although present in the rubber in only very small quantities.

Effect of Time of Cure on Coefficient of Vulcanization

The question further arises, which types of plantation rubber show a coefficient higher than the normal, and which show a lower one?

B. J. Eaton and F. W. F. Day[4] found the coefficient of vulcanization for standard mechanical properties (their optimum curve) to be:

	Standard Time of Cure Hours	Coefficient of Vulcanization Per Cent
Ordinary crêpe	3.25	4.1 –4.5
Crêpe from matured rubber	1.25	4.65–5.1

Matured rubber is prepared by keeping the coagulum in the wet state for some time. A decomposition then sets in, and the protein decomposition products cause an increased rate of cure. Eaton and Day therefore find an increase in coefficient, proportioned to the natural accelerator content of the rubber.

Plantation rubber seems to show a higher coefficient of vulcanization than normal when it is quick-curing, independent of whether the quicker cure is caused by unchanged latex constituents or by decomposition products formed by maturation.

Summary

The natural accelerator or accelerators in rubber cause an increase in coefficient of vulcanization for fixed mechanical properties, which amounts to about 0.5 for all types of quick-curing rubber, independent of their composition. The natural accelerators therefore act in exactly the opposite way from the artificial accelerators about which data are now available.

The effect of the natural accelerators on the coefficient for a fixed curve seems to be much less pronounced than in the case of those artificial accelerators.

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[1] Journal of Industrial and Engineering Chemistry, Vol. 13, No. 12, December, 1921, 1133-1134.

[2] Central Rubber Station, Buitenzorg, Java.

[3] "Estate Rubber: Its Preparation, Properties and Testing," 463, 542.

[4] Journal of the Society of Chemical Industry, 36 (1917), 1116.

Chemical Patents

The United States

COMPOSITION FOR RUBBER FINISH. This consists of rubber, silicate of sodium, raw linseed oil and drier substance with coloring matter. William E. Miller, Renton, Washington. United States patent No. 1,400,090.

MIXING PIGMENTS WITH RUBBER. The process of compounding rubber, comprising mixing it with a mass of pigment in which the particles are bound together by a binder disseminated uniformly throughout the mass of the pigment. Chester J. Randall, Naugatuck, Connecticut, assigned to The Goodyear's Metallic Rubber Shoe Co. United States patent No. 1,405,439.

PROCESS OF VULCANIZATION. This is characterized by heating rubber with barium thiosulphate. Edgar Levinstein, Boston, Massachusetts. United States patent No. 1,406,197.

VULCANIZING CAOUTCHOUC. The process consists in incorporating a small percentage of the reaction products of paranitroso dimethyl aniline with less than two molecules of hydrogen sulphide into a caoutchouc mixture and heating with a vulcanizing agent. Clayton W. Bedford and Robert L. Sibley, Akron, Ohio, assignors to The Goodyear Tire & Rubber Co., Akron, Ohio. United States patent No. 1,406,717.

THIOCARBANILIDE DERIVATIVES IN THE VULCANIZATION OF CAOUTCHOUC. Adding a small proportion of the thiourea derivative-containing reaction product of carbon disulphide on the base resulting from the reaction of one mol of paranitroso body with less than two mols of hydrogen sulphide, and heating the resultant mixture with a vulcanizing agent to effect vulcanization. Clayton W. Bedford and Robert L. Sibley, assignors to The Goodyear Tire & Rubber Co., all of Akron, Ohio. United States patent No. 1,406,718.

MANUFACTURE OF THIOCARBANILIDE FOR VULCANIZATION OF CAOUTCHOUC. The process which consists in incorporating into the caoutchouc mix a small percentage of a mixture of substituted thioureas, and heating the mass with a vulcanizing agent to effect vulcanization.—Clayton W. Bedford and Robert L. Sibley, assignors to The Goodyear Tire & Rubber Co.—all of Akron, Ohio. United States patent No. 1,406,719.

The United Kingdom

INDIA RUBBER COMPOSITIONS. Clay is mixed with india rubber in the presence of a water-soluble soap or of ingredients which will produce such a soap. The clay is purified by any process, preferably by peptization as described in specifications Nos. 106,890 and 121,191. In an example, three per cent anhydrous sodium carbonate, and three per cent sodium oleate are incorporated with such prepared clay by grinding. A mixing of 57 parts rubber, 40 parts of this treated clay, and three parts sulphur is vulcanized in 45 minutes at 40 pounds pressure per square inch. Increasing the proportion of the soap, etc., increases the rate of curing.—W. Feldenheimer, 20 Holborn Viaduct, London; W. W. Plowman, 83 St. Leonard's Road, East Sheen, Surrey; and P. Schidrowitz, 57 Chancery Lane, London. British patent No. 172,711.

VULCANIZING BALATA, ETC. Balata and gutta percha are vulcanized by treatment with sulphur dioxide and hydrogen sulphide. The balata, etc., may be in the solid form or in solution, and the treatment may take place at atmospheric or higher pressure. Examples, sheets of balata of 0.2 to 0.5-mm. thickness are exposed to an atmosphere of sulphur dioxide for ten minutes and then to an atmosphere of hydrogen sulphide for thirty minutes; or 15 cc. of a ten per cent solution of balata or gutta percha in carbon disulphide saturated with hydrogen sulphide is mixed centration 2.2 cc. of a solution of sulphur dioxide in benzene of concentration 2.4-g. gas in 100 cc. of solvent. The solution gradually sets to a jelly from which the solvent may be evaporated.—S. J. Peachey, 5 Yew Tree Road, Davenport, Cheshire, and A. Skipsey, Red Lea, Scarborough. British patent No. 172,754.

New Zealand

RUBBER TIRE RETREADING. The old tread is left on the tire and heated by a blue-flame torch until the rubber is partly or wholly desulphurized. The sticky surface is covered quickly with a cement made of raw rubber mixed with carbon tetrachloride and a small quantity of sulphur. The cement dries promptly and enough new rubber is applied to make a new tread. The tire is then vulcanized in the usual manner—Emil Nestler, Bergenfield, New Jersey, U. S. A. New Zealand patent No. 45,640.

Japan

COVERING WIRE WITH RUBBER. Copper wire is passed into the following baths: a vessel containing pasty raw rubber; a vulcanizing bath containing five per cent gasoline solution of sulphur dichloride; a heating bath; and a bath containing five per cent of ammonia water.—Kinsuke Fukuda. Japanese patent No. 37,110.

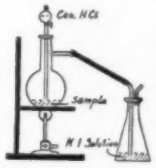
Laboratory Apparatus

Method for the Analysis of Red Lead and Orange Mineral[1]

In estimating the value of red lead and of orange mineral for the paint trade it is necessary to determine the true amounts of red lead and of litharge present. A rapid and accurate method is needed and such may be obtained by utilizing the fact that true red lead (Pb_3O_4) will oxidize HCl, while litharge (PbO) will not. These reactions may be expressed as:

1. $Pb_3O_4 + 8\ HCl = 3\ PbCl_2 + 4\ H_2O + 2\ Cl$
2. $PbO + 2\ HCl = PbCl_2 + H_2O$

One gram of sample is treated with 30 to 50 cc. of concentrated HCl; solution being heated throughout the reaction. The evolved chlorine is passed through 150 to 200 cc. of a 10 per cent KI solution. The apparatus used is illustrated and is similar to that used in Bunsen's method for the determination of available oxygen in pyrolusite.



The reaction is complete when the concentrated acid solution becomes quite clear. After completion, the iodine solution is transferred to a volumetric flask and made up to one liter. A portion is withdrawn and titrated against one-tenth normal $Na_2S_2O_3$ solution, using starch as the indicator.

Calculate the amount needed for the whole solution and multiply by .03428 (the weight of Pb_3O_4 in 1 cc. of one-tenth normal solution). This result equals the weight of Pb_3O_4. Moving decimal two places to the right, we obtain percentage of same. The balance is PbO.

[1] Theodore F. Bradley in Chemist-Analyst.

HANDLING PHOSPHORUS STICKS[1]

Yellow stick phosphorus is extremely difficult to handle. It must be kept under water to prevent fires and watched to prevent the water from evaporating and leaving the phosphorus dry. When one attempts to cut it the round sticks persistently slip out of the tongs. To remedy all this, place the sticks in a saturated solution of copper and they will soon become coated with a layer of metallic copper. They are then fireproof and safe to handle. They may be picked up and cut as required. Any remainder is replaced in the copper sulphate solution to be ready again when needed.

[1] C. F. Barth, in the Chemist-Analyst No. 35, 1921.

Recently Published Articles Relating to Rubber

The Stress-Elongation of Vulcanized India Rubber[1]

By Emil Hatschek, F. I. P.

The author compares the usual form of stress-strain curve, illustrating the behavior of vulcanized rubber under tensile stress which shows an inflection approximately at 100 per cent elongation, with the more rational representation obtained by plotting the actual stress per unit area of the *cross-section corresponding with the elongation* rather than per unit area of the original cross-section. As the volume of rubber is generally taken to remain constant, within wide limits, during deformation, the actual stress can easily be deducted from the load as registered by the testing machine. At 100 per cent elongation the length of the test piece is double, and the cross-section one-half the original value. The stress per unit area of actual cross-section is therefore double the load per unit area of original cross-section.

The true stress-elongation curve can be deducted from the load-elongation curve by multiplication of the abscissæ by the appropriate factors; the abscissa for 100 per cent elongation by two, that for 200 per cent by three, and so forth. The curve obtained has no inflection and the change in curvature is quite gradual.

The author treats the determination of the load elongation curve analytically and shows that certain properties of the curve may be coordinated empirically with qualities of the material, citing the slope corresponding with a given elongation, and the area enclosed by the curve.

[1]Journal of the Society of Chemical Industry, Volume XL., No. 21, page 251T to 253T.

Permeation of Rubberized Fabrics of Oxygen Breathing Apparatus by Gases and Vapors[1]

By A. C. Fieldner, S. H. Katz, and S. P. Kinney

Tests on ordinary commercial breathing bags of rubberized fabric in an atmosphere containing 34 per cent of casinghead gasoline vapor showed that up to 2.6 per cent of the vapor was in the bag after 15 minutes' exposure. A description of an apparatus designed to test the permeability of any fabric to gases and vapors is given together with a large number of results obtained with it for different fabrics and gases. All the fabrics used by the Bureau of Mines except the "Fleuss," consisting of heavy sheet rubber 1/16-inch thick, were found to be permeable to gasoline, benzine, and similar organic vapors but not to carbon monoxide or natural gas. A fabric made of two rubberized sheets cemented with a mixture of glue and glycerine and only one-third as thick as the rubber sheet was completely impermeable and did not deteriorate on exposure to weather, hot dry air, or freezing temperatures, or after rough mechanical treatment. A cloth fabric impregnated and coated on one side with pyroxylin varnish allowed only a small amount of gasoline or benzene vapor to pass through it in two hours and probably, with a thicker coat of varnish, could be made impermeable.

[1]United States Bureau of Mines Technical Paper No. 272, 1921.

The Detection of Accelerators[1]

By D. F. Twiss and G. Martin

The following outline of the method for the detection of accelerators in vulcanized rubber as developed by Twiss and Martin is that condensed by *Chemical Abstracts*.

The detection of organic accelerators by total nitrogen determination is useless. They can, however, be nearly all extracted with acetone, whereas the nitrogen of most other ingredients remains behind.

[1]A paper read at the International Rubber Conference, London, June, 1921.

Two grams of rubber are extracted for several hours with acetone, if aldehyde-ammonia is suspected, a little hydrochloric acid is added, the acetone evaporated and nitrogen in the residue determined by the Kjeldahl method. If the nitrogen exceeds 0.05 per cent an organic accelerator is probably present. The indentification is often impracticable on account of its decomposition during and after curing. Likewise the per cent originally present is very uncertain. A tentative scheme useful in some cases is outlined covering aldehyde ammonia, nitrous compounds in general, *p*-nitroso dimethylaniline, hexamethylene tetramine, furfuramide, hydrobenzamide, alkylamines, and alkyl-ammonium dithiocarbamates.

Energy-Absorbing Capacity of Vulcanized Rubber[1]

By H. P. Gurney and C. H. Tavener[2]

It is the purpose of this paper to indicate some relations which exist between the capacity of vulcanized rubber to absorb or to store up in a potential form and partially to transform or degrade kinetic energy into heat when subjected to single or repeatedly applied stresses, and factors of construction, such as type of crude rubber, rubber content, and particularly the temperature and duration of cure or heat treatment.

The discussion is entirely mathematical, illustrated by many curves, and is summarized in the following:

Conclusions

1. Fine Pará possesses no distinct advantage over plantation rubber so far as tensile capacity, speed of cure, or hysteresis endurance are concerned.
2. Excess cure produces lower hysteresis on all cycles than more moderate cure.
3. Undercure produces greater hysteresis on the first cycle, but more rapid decay on following cycles than moderate cure.
4. The chief advantages of a pure gum stock lie not in a higher hysteresis on the first cycle but in: (a) greater capacity to absorb energy prior to rupture; (b) superior hysteresis endurance; (c) greater rate of extension per rate of energy absorption, hence transfer of energy from airplane to shock absorbers and reverse is slower, thereby setting up lesser stresses in the airplane.

[1]The Journal of Industrial and Engineering Chemistry, Volume 14, No. 2, February, 1922, pages 134-139.
[2]Boston Belting Co., Boston, Mass.

LITHOPONE IN AMERICAN INDUSTRY

The quantity of lithopone marketed in the United States in 1920 is reported as 89,373 short tons. The following manufactures utilized this material in approximately the proportions indicated, rubber goods, 10 per cent; linoleum, 15 per cent; oil cloth, 10 per cent; paints, 60 per cent; all other uses, 5 per cent.

HARDWOOD PITCH

RSL hardwood pitch is a distillation residue from certain hardwood oils. It is one of the best softening materials known and it is not a depolymerizer of rubber, consequently its aging properties are excellent. It is suitable for calendered, frictioned, or tubed stocks. As a rule, from one to two per cent only is required in the batch. For very dry stock more may be desirable.—The Rubber Service Laboratories Co., Akron, Ohio.

DIPHENYLGUANIDINE PATENTED

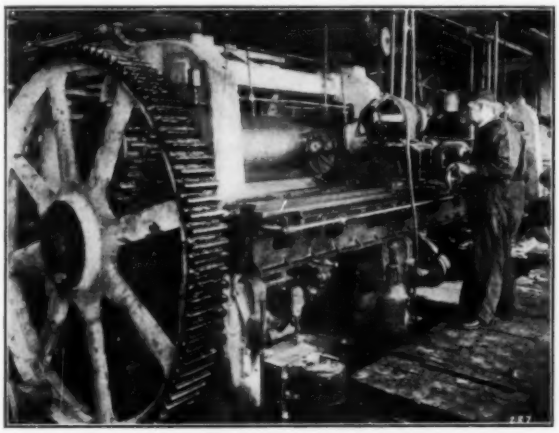
The Dovan Chemical Corporation, Newark, New Jersey, manufacturer of diphenylguanidine, has been granted a United States patent covering the use of this material in any form as an accelerator. The States Metals Co., Inc., 30 Church street, New York, N. Y., announces that it is the sole selling agent of the Dovan company in the sale of diphenylguanidine. As yet no one has been licensed to manufacture diphenylguanidine in any form.

New Machines and Appliances

Calender-Roll Grinder

THE illustration shows a portable calender-roll grinder of special design adapted for attachment to the calender housing, dispensing with the necessity of unsteady blocking as a support.

The machine has a mechanical crowning attachment which is very accurate in use. Rolls from 40 to 90-inch length can be



Portable Roll Grinder

ground on any make of calender. A manufacturer provided with this machine can regrind or change the crown of any of his calender rolls without delays, which is always a matter of great importance, especially where calendering and grinding facilities are restricted.—Allen Machine Co., Erie, Pennsylvania.

Mechanical and Electrical Safety Stop

The illustration shows a perfected mechanical and electrical safety stop for use on rubber-mill lines made for 100, 150 and 200 horsepower and to handle as many machines as desired.

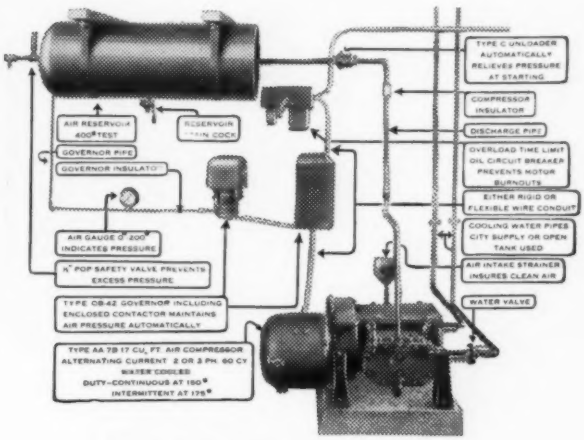
This apparatus consists of a hand-reset brake, 30 by 4, on the high-speed drive-shaft operated by a wire cable from an overhead shaft. At the end of this shaft a small switch is wired in series with the low-voltage release on the motor. Wire cables run from the overhead shaft arms to an arm on the bar control on the top of the mill. This bar control can be operated from either side of the machine in either direction by some portion of the operator's body, should both his hands be caught.

The operating switch with low voltage release throws the current off the motor and at the same time trips a lever on the hand-reset brake which stops the momentum of the drive.

This arrangement has been approved by New Jersey authorities and has been satisfactorily demonstrated by six to eight months' use in rubber factories.—William R. Thropp Sons' Co., Trenton, New Jersey.

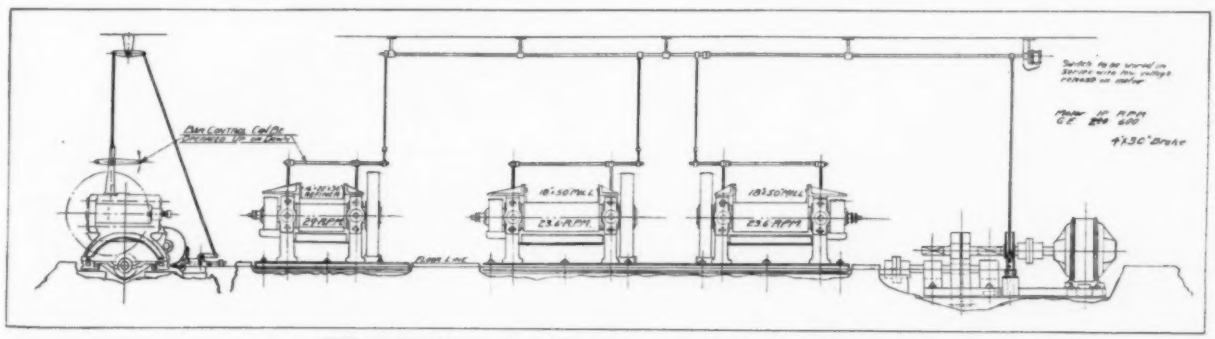
Compact Air Compressor

In common with many others, the rubber manufacturing industry utilizes compressed air as a medium for storing, converting and transmitting energy for various applications. The more common uses in rubber factories for compressed air are for operating air hoists at calenders, blowing hose and tubing from mandrels, dusting the interior of tubes with soapstone or removing dust from molds, etc.


TYPE C UNLOADER AUTOMATICALLY RELIEVES PRESSURE AT STARTING
COMPRESSOR INSULATOR
DISCHARGE PIPE
OVERLOAD TIME LIMIT OIL CIRCUIT BREAKER PREVENTS MOTOR BURNOUTS
EITHER RIGID OR FLEXIBLE WIRE CONDUIT
COOLING WATER PIPES CITY SUPPLY OR OPEN TANK USED
AIR INTAKE STRAINER INSURES CLEAN AIR
WATER VALVE
AIR RESERVOIR 400# TEST
RESERVOIR DRAIN COCK
GOVERNOR PIPE
GOVERNOR INSULATOR
AIR GAUGE 0-200# INDICATES PRESSURE
SAFETY VALVE PREVENTS EXCESS PRESSURE
TYPE OB-42 GOVERNOR INCLUDING ENCLOSED CONTACTOR MAINTAINS AIR PRESSURE AUTOMATICALLY
TYPE AA 7B 17 CU. FT. AIR COMPRESSOR ALTERNATING CURRENT 2 OR 3 PH. 60 CY. WATER COOLED
DUTY—CONTINUOUS AT 150#
INTERMITTENT AT 175#

Allis-Chalmers Air Compressor

The air compressor here shown is of the single-acting duplex type with horizontal cylinders. The crank case and cylinders are integral. A one-piece cylinder head covers both cylinders and contains recesses for the suction and discharge valves. The pistons are of the trunk type fitted with accurate three-part metal piston rings. They are operated by connecting rods having suit-



William R. Thropp Sons' Co. Safety Stop for Rubber Mill Lines

able bearing bushings and convenient means for taking up wear. The crank-shaft is of heavy design of high-grade steel and turns in journal bearings of ample proportions to insure minimum wear.

The moving parts, which are lubricated by the splash caused by the dip of the connecting rods in the partly oil-filled crank case, are accurately balanced, resulting in freedom from vibration and smooth, silent operation.—Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin.

Simple Tire Removal Tool

Many jobs in tire repairing require special tools and the ingenuity of the tire repairman is often called upon to design them.

The illustration shows a new and simple tool for loosening tight-fitting pneumatic truck tires from rims.

The tool is a broad stiff blade of steel fastened in a wood cross piece which serves as a hand hold for both hands.

To operate the tool the side rings are removed from the rim and the thin blade is forced between the tire bead and rim, cutting through the rust. In this way the adhesion between the beads, flaps and the rim is reduced sufficiently to make easily removable the tightest fitting tire.—Oscar M. Fredd, Hancock, Michigan.

Tire Removing Tool

Footwear Repair Vulcanizer

The latest model of vulcanizer for making a vulcanized repair on a rubber boot or shoe is shown in the illustration.

"Hot Spot" Vulcanizer

The device is arranged for heating with steam and by means of a screw operated by a hand-wheel, pressure is applied only to the area undergoing repair. This eliminates the necessity of pressing the boot out of shape while holding it on the curing mold.—E. C. Julian, Elwood, Indiana.

Bristol Headless Set-Screw

A safety set-screw has recently been perfected which goes in easily and sets tightly and firmly without splitting. The screw is made in six varieties of points, and is bored and fluted to receive a wrench for setting it in place. It cannot split, owing to the absence of splitting strains.—The Bristol Co., Waterbury, Connecticut.

Steam Generator for Repairmen

A feature of this new type of boiler which is especially designed for small vulcanizing shops is the fact that it has no flues, tubes, or coils. The generator is placed directly above the gas flame, and receiving the water from the upper shell in small volume, heats it and passes it again into the upper shell. The steam from these boilers is very dry, as they are so constructed that they will not prime or suck water with the steam. Having no flues, tubes and coils there is no internal construction to give out and burn out.

These steam generators, for gas or kerosene, are made from 1½ to 5 h.p., with working pressure from 15 to 100 pounds. All are fully equipped with fuse plugs, try cocks, steam gages, water glass, and inspector's gage connection when required, while all plans and specifications are stamped according to the A. S. M. E. New York State code.—Syracuse Steam Generator Co., South avenue and Grant Place, Syracuse, New York.

Ideal Steam Generator

Portable Sifter for Compounding Ingredients

Combs Gyratory Sifter

An electrically-operated gyratory sifter is shown in the accompanying illustration. Operated from a lamp socket and suspended on a cable it is transferable by trolley for sifting and discharging material at any desired point.

Although devised for sifting foundry sand, it has been found useful, with suitable screens, for sifting rubber compounding ingredients.

An important feature in this machine is that the motor which operates it is placed well above the sieve, and therefore it is impossible for the sifted material to interfere with its working.

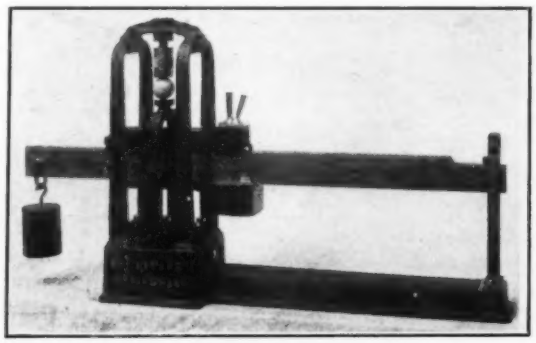
Another valuable operating feature is the ease and facility with which the wire cloth-sieve bottoms can be changed or removed. It is a fact that a gyratory sifter has double the working capacity of one of reciprocating motion.—Great Western Manufacturing Co., Leavenworth, Kansas.

"NEVER SLIP" LOCK WASHER

A practical shakeproof lock washer of universal application is made with radial toothed surface on each side which cuts into and grips the units under which it is used so that it cannot loosen. It will not loosen under excessive vibration, is rust-proof, and has numerous other advantageous features—Tucker Tool & Machine Co., 75 Murray street, New York, N. Y.

Machine for Testing Golf Balls

The illustration shows an English machine for testing the elasticity or resiliency of golf balls, or solid rubber cores and gutta percha, the elasticity and toughness of which must be properly controlled. The machine compresses a ball, measuring this effect in thousandths of an inch under any load up to 155 pounds.



Avery's Golf-Ball Testing Machine

In operation the ball is placed between two platens, the poise weight is set for any desired load, and the deflection read from the scale at the end of the beam.

The machine can be used for checking the work of each winder and so maintain strict uniformity of product.—W. & T. Avery, Limited, Soho Foundry, Birmingham, England.

Motor-Driven Rubber Cutter

A recently-patented and ingenious device has been found to save much time and hand-labor for the tire repairman.

Mechanical Rasp

The rotary rubber cutter illustrated is attached to a motor, and is designed to replace the common hand and rasp method ordinarily used in practice. The inventor claims that by means of this device one man, in preparing casings for cement, can do the work of five. The blades of the cutter are cast as an integral part of a circular band, the whole of which is detachable from a two-piece section. These blades can be sharpened when necessary.—John M. Roll, 208 Galesburg Road, Knoxville, Indiana.

Machinery Patents

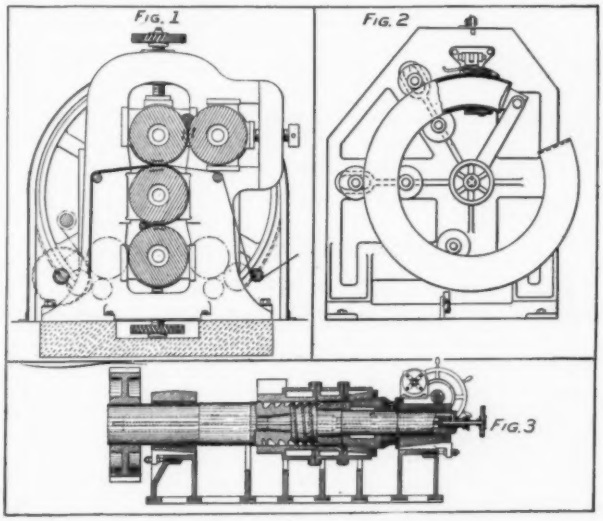
Coating Fabrics with Rubber

A method of skim-coating both sides of fabric in one operation by a single pass between the calender rolls is shown in Fig. 1. The fabric enters the machine under the overhanging roll. The skim coats of rubber are derived from the upper and lower stock feeds as indicated and applied to both sides of the fabric at the same time and under equal heat and pressure—G. F. Fisher, assignor to Revere Rubber Co., Providence, Rhode Island. United States patent No. 1,402,288.

Tube-Stripping Machine

A machine for stripping inner tubes from circular mandrels is shown in Fig. 2. The essential features are: the driving arrangement, the device for holding and allowing the mandrel to rotate, and the mechanism for supplying the air used for blowing off the tube. The mandrel is supported on a series of rollers adjustable to fit the size of the mandrel and allowing it to rotate.

In operation, one end of the tube is turned back by hand and held in position over the outside of an air ring by a ring beveled on its inside. Compressed air is conducted to the pocket formed by the turned-back tube and serves to detach the tube from the mandrel as it is reversed upon itself. After a tube has been about half-stripped it is pulled off by hand over the remaining portion of the mandrel.—Charles E. Maynard, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts. United States patent No. 1,402,171.



Calendering, Tube-Stripping, and Refining Machines

Rubber Refiner

In Fig. 3 is shown a longitudinal section of a machine for refining and masticating rubber and discharging the product in a smooth plastic state.

The stock is forced from a hopper by a rotary feed screw into a stationary external massing die where it is ground and masticated by the cooperation of a rotating internal massing die with the wall of the external massing die. The stock is then forced into a stationary external refining die where it is still further reduced under great pressure by the action of a rotatory internal refining die which cooperates with the wall of the external refining die for completing the reduction and mastication of the stock.

The machine is piped for water circulation for cooling the rubber, and the internal and external parts may be moved longitudinally to permit accurate adjustment and cleaning when necessary. This movement of parts is so controlled that the dies cannot be damaged by inaccurate adjustment or careless handling—W. A. Gordon, assignor to Birmingham Iron Foundry, Derby, Connecticut. United States patent No. 1,403,681.

Manufacture of Rubber "Sailor" Bathing Caps

Two sheets of unvulcanized rubber are laid one upon the other on a platen and cut by a die with blunt edges, as shown in Fig. 1. The die cuts out two circular blanks and unites their edges. An X-shaped cut is then made in the center of the upper sheet to provide an opening for a circular platen that is next inserted through the slit. The central dowel pin of this platen cooperates with the central opening of a steel-cutting and joining die, shown in Fig. 2. An endless band of rubber forming the head band of the cap, is stretched around the outer surface of the die, its upper edge being brought in contact with a flange guide to determine the width of the band. The lower edge of the band is stretched inwardly over the cutting edge of the die.

Fig. 1. Forming Head Portion

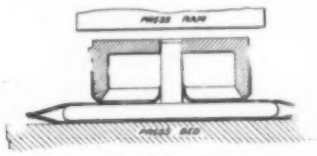


Fig. 2. Applying Head Band

Pressure applied to the die forces it upon the platen cutting and joining at the same time the rubber band and blank of the cap along the circular line of the cutter. The cap produced is of the sailor type and is ready for vulcanization in the usual manner.—Ralph E. Riley, assignor to The Miller Rubber Co., Akron, Ohio, United States patent No. 1,388,762.

Other Machinery Patents

The United States

1,405,383 Attachment for mixing mills. A. O. Abbott, Jr., assignor to Morgan & Wright — both of Detroit, Mich.

1,405,418 Apparatus and method for wrapping uncured tubes from cured tubes. T. A. Jordan and A. E. Caesber, assignors to G. & J. Tire Co. —all of Indianapolis, Ind.

1,405,427 Apparatus for building cord tires. C. F. Offensend, assignor to The Miller Rubber Co.—both of Akron, O. Original application divided.

1,405,470 Apparatus and method for making resilient tires. G. H. Wheatley, Milwaukee, Wis.

1,405,992 Apparatus for making cord fabric and the fabric so made. I. E. Fair, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,406,062 Ventilating device for calender. C. A. Myers, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.

1,406,156 Stepping tool. E. J. and R. E. Cotter, Philadelphia, Pa.

1,406,261 Rubber boot repair vulcanizer. E. C. Julian, Elwood, Ind.

1,406,358 Apparatus for producing rubber soles. G. Ferguson, Wollaston, Mass., assignor by mesne assignments to the United Shoe Machinery Corporation, Paterson, N. J.

1,406,433 Tire vulcanizing mold. R. H. Atcheson, Hartford, Conn. assignor to H. J. Doughty, Providence, R. I.

1,406,640 Expansible core for vulcanizing tires. W. A. and M. F. Gram, Welland, Ont., Can.

1,406,666 Mixing and kneading machine and process. A. P. Lohmann, Akron, O.

1,406,855 Apparatus for making tire beads. W. B. Harsel, assignor to The Goodyear Tire & Rubber Co . —both of Akron, O.

1,406,895 Apparatus for rolling tires. O. Reifurth, Bochum, Germany.

1,406,919 Apparatus for the production of rubber-coated textiles, etc. A. Boecler, Malmo, Sweden, assignor to Benzine Condensation Co., Inc., a New York Corporation.

1,407,193 Device for loosening rubber tires from molds. A. P. Diescher, Pittsburgh, Pa.

1,407,355 Core for tire molds and method of vulcanizing. V. K. Sturges, Oakland, Calif.

1,407,682 Combination mold. A. L. Seavoir, Stamford, Conn.

1,407,712 Bead cut off machine. W. C. Stevens and E. D Putt, assignors to the Firestone Tire & Rubber Co., all of Akron, O.

1,407,718 Expansible core for vulcanizing tires. H. J. Bittaker, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.

1,407,757 Device for placing washers on mold pins in rubber heels. W. D. Kmentt, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,407,771 Repair vulcanizer. W. Reilly, Kerrisdale, New Brunswick, Can.

1,407,979 Machine for making battery jars and other hard rubber receptacles. J W. Bishop, Muskegon, Mich., assignor to The Brunswick-Balke-Collender Co., Chicago, Ill.

1,407,980 Machine for making battery jars. J. W. Bishop, Muskegon, Mich., assignor to The Brunswick-Balke-Collender Co., Chicago, Ill.

1,408,044 Tire-forming core. K. O. B. Textorius, assignor to Tex Engineering Corporation—both of New York, N. Y.

1,408,099 Tire-deflating machine. H. P. Kraft, Ridgewood, N. J.

1,408,100 Mold for making cushion tires. F. A. Krusemark, assignor to K., F. & C. Tire & Rubber Corporation—both of Roanoke, Va.

1,408,382 Repair vulcanizing apparatus. H. E. Merriss, Enfield, assignor to Harvey Frost & Co., Limited, London—both in England.

Reissues

15,284 Tire core stripping machine. C. Kuentzel, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y. Original No. 1,395,434, dated November 1, 1921.

The United Kingdom

172,699 Airbag for vulcanizing tires. C. L. Smith, 801 Cedar street, and E. S. Webster, 928 Niles avenue, both in South Bend, Ind., U. S. A.

172,976 Rubber-working machine. Farrel Foundry & Machine Co., 30 Main street, assignee of D. R. Bowen, 5 Clover street, and C. F. Schnuck, 80 North State street—all of Ansonia, Conn., U. S. A. (Not yet accepted.)

172,977 Rubber-working machine. Farrel Foundry & Machine Co., 30 Main street, assignee of D. R. Bowen, 5 Clover street, and C. F. Schnuck, 80 North State street—all of Ansonia, Conn., U. S. A. (Not yet accepted.)

173,279 Mold for vulcanizing two-part rubber tire core. A. E. White, 88 Chancery Lane, London. (Standard Rubber Works Proprietary, Limited, 395 Collins street Melbourne, Australia.)

173,325 Repair vulcanizing apparatus. H. E. Merriss, 44 Parsonage Lane, Enfield, Middlesex, and H. Frost & Co., Limited, 148 Great Portland street, London.

173,589 Machine for winding webs. E. C. R. Marks, 57 Lincoln's Inn Fields, London. (Cameron Machine Co., 61 Poplar street, Brooklyn, New York, U. S. A.)

173,592 Apparatus for cutting bias strips from tubes of fabric. A. C. Bunker, Montclair, New Jersey, U. S. A.

The Dominion of Canada

215,592 Airbag with self-contained heating means. O. M. Fredd, Hancock, Mich., U. S. A.

215,832 Machine for wrapping tires. E. E. Shoopman, Cairo, Neb., U. S. A.

Germany

Patents Issued, with Dates of Issue

350,078 (August 28, 1920) Apparatus for vulcanizing tires. Joseph Ledvinka, Philadelphia, United States; represented by: H. Caminer, Berlin W. 62, and K. Wentzel, Frankfort-on-the-Main.

350,196 (June 17, 1920) Alarm device for decreasing air-pressure in air-chambers of pneumatic tires. Kaufmann & Schroder, Werdohl, Westphalia.

350,294 (April 19, 1921) Hand-press for vulcanizing rubber tubes. Arnold Max Bree. Sudwestkorso 15, Berlin-Friedenau.

Design Patents Issued, with Dates of Issue

803,967 (October 14, 1921) Portable vulcanizing apparatus with detachable bottom. Paul Tischendorf, Triftstrasse 41, Berlin.

804,015 (October 20, 1921) Vulcanizing apparatus. Erich Grimpe, Berchtesgadener Strasse 27, Berlin-Schöneberg.

804,108 (May 10, 1921) Device for sterilizing and keeping surgical rubber goods and the like. Aktiebolaget Stille-Werner, Stockholm; represented by A. Trautmann and H. Kleinschmidt, Berlin S. W. 11.

804,332 (September 12, 1921) Core for solid tires. Hermann Budde, Ohligs.

804,933 (January 3, 1922) Coupling for tube ends for hot vulcanization. Hans Kelch, Kotzschenbroda in Sa.

805,487 (January 9, 1922) Press for cementing on rubber heels and soles. Oskar Bottger, Hugelstrasse 128, Frankfort-on-the-Main-Eschersheim.

Process Patents

The United States

1,405,440 Solidifying pulverulent material. C. J. Randall and R. R. Taylor, assignors to the Goodyear's Metallic Rubber Shoe Co.—all of Naugatuck, Conn.

1,405,453 Making soles for turned shoes. A. A. Somerville, Flushing, assignor to New York Belting & Packing Co., New York—both in New York.

1,405,845 Treating golf balls. H. A. Hoffman, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,405,998 Making rubber cylinders. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,406,160 Manufacture of rubber jars. L. E. Klug, assignor to Rub-Tex Products, Inc.—both of Indianapolis, Ind.

1,406,654 Deresinating and purifying balata. C. H. Keith and N. G. Madge, Providence, R. I., assignors to Revere Rubber Co., a Rhode Island corporation.

1,406,669 Making inner tubes. D. C. McRoberts, assignor to G. & J. Tire Co.—both of Indianapolis, Ind.

1,407,159 Forming tire casings. J. P. King, assignor of ½ to L. E. Danforth—both of Providence, R. I.

1,407,839 Manufacture of tires. J. C. Clinefelter and H. Ries, both of Barberton, O.

New Goods and Specialties

All-Rubber Tooth Brush

THE all-rubber tooth brush has arrived to help the sales of dealers in toilet goods and druggists' sundries. It is made of white rubber molded over a metal reenforcing strip the length of the handle and back, in a two-piece mold. The "bristles" are molded in one with the top portion and are entirely of rubber. There is a perforation in the end of the curved handle to permit the "No Bristle" tooth brush to be hung up.—The No Bristle Brush Co., 10 High street, Boston, Massachusetts.

"No Bristle" Tooth Brush

Swimming Belt Flat Under Arms

Dealers in bathing apparel and sporting goods as well as in tires and accessories, will be interested in a new swimming belt which is a modification of the familiar inner tube. It is so constructed that it is flat under the arms of the wearer, to permit greater freedom in swimming, and it has the added advantage that it can be inflated by lung power and does not require a pump.

"Delion" Swimming Belt

The "Delion" swimming belt with this patented flat feature is made in different sizes to fit large and small people and comes packed in a carrying bag that will also hold the bathing suit. When warm weather comes, dealers should find this belt a profitable item.—Delion Tire & Rubber Co., Baltimore, Maryland.

Armored Cord Tire

A cross-section of the "Marine Armored Cord" tire is shown in the illustration, combining the advantages in metal reinforcement of maximum tensile strength with great resiliency. Thin strips of corrugated alloy steel encircle the tire section from bead to bead at close intervals. This armor ply, lying between the inner and outer sets of cord plies, is embedded in rubber. The armor plates do not generate internal heat but add resilience to the tire. The tendency for the tire to rebound is neutralized by the armor, insuring increased riding comfort.—Ludington Rubber Co., Ludington, Michigan.

"Marine Armored Cord"

Goggles for Grinding Operations

The goggle with rubber-padded frame is always comfortable because it fits closely. The padding on the one shown here is cemented in place so that it will not loosen. The lens is interchangeable, as well as the elastic headband, and either lens or headband can be replaced when necessary. This goggle is recommended by dealers in safety devices for high speed emery wheel work, dry dust operations, and light grinding.—F. A. Hardy Safety Department, 10 South Wabash avenue, Chicago, Illinois.

Rubber-Padded Goggle

Adjustable Rubber Cigar Holder

The application of hard rubber to the manufacture of many articles requiring a composition unaffected by moisture, chemicals, or acids, but which shall still be good-looking, have a smooth finish, and be capable of polish, is once more exemplified in the adjustable cigar and cigarette holder pictured here. Inside the holder a cone-shaped piece of soft rubber adds to its ability to grip firmly any size of cigar or cigarette and the band around the outside slides up as desired, compressing the slit tongues.—Durable Devices Manufacturing Co., 11 West Poplar avenue, Columbus, Ohio.

"Fits M All" Cigar Holder

Brush Held by Vacuum Cup

A brush or washing device suitable for use by a person without hands or with only one hand has been devised, which attaches to any plane surface by means of a rubber cup on the back. When this is pressed against the bottom of a bowl, the wall back of a faucet, or elsewhere, it will stay firmly in place because of the vacuum created. The device has been patented by the inventor.—W. L. Finkhousen, Route No. 5, Van Wert, Ohio.

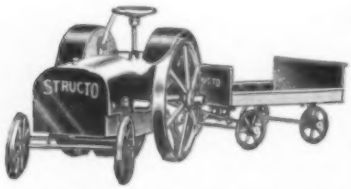
Cripple's Brush

Rubber Triangle to Hold Rugs Flat

A triangular rubber corner to attach to the corners of rugs to keep them flat on the floor, at the same time preventing them from slipping, is manufactured by the American Rubber Heel Co., Duluth, Minnesota, on the molds and under the patent of the Klearflax Linen Rug Co. of the same city. The short and long sides of the rubber triangle are about four and six inches long, respectively, and in each corner are three holes for sewing to rugs. The corner is intended especially for Oriental rugs, as the Klearflax rugs do not curl.

Rubber Tires for Toys

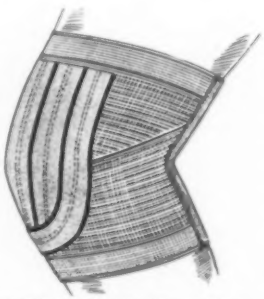
The realistic toys here shown are made of metal, nicely finished and painted, and all the wheels have rubber tires. They are not the pneumatic kind or even an imitation of them, but are a very good toy representation of solid-tired tractor wheels. The rubber is a flat band, grooved horizontally, and applied to the metal wheels. The dealer who wants to handle a tractor and trailer of up-to-date model will profit by the "Structo" toys which are about 8 inches long by 4 in. width.—Structo Manufacturing Co., Freeport, Illinois.



Rubber-Tired Toy Tractor and Trailer

Padded Elastic Knee Cap

Athletic supply houses and sporting goods dealers will want to know about this new padded knee cap. It is carefully made of wide elastic webbing suitably padded over the knee and reinforced at the edges and back. This cap gives athletes protection without being stiff enough to interfere with freedom of action.—Bennett Elastic Web Co., 2430 North Oakley avenue, Chicago, Illinois.



Padded Athletic Knee Cap

"Rideezee" Inner Tire

A yellow composition tire filler that is soft and spongy like artists' erasers, but which the manufacturer claims will give more satisfaction than many other substitutes for air in pneumatics, is manufactured by Dahl's Rideezee Co., 487 University avenue, St. Paul, Minnesota, and is called the "Rideezee."

English Beauty Aid Has Automatic Valve

The patented "Beauty Belle" red rubber suction vacuum cup is used by hand to remove lines and freshen the skin. There is a disk valve beneath the top opening of the device. No electricity or other apparatus is required.—Reliance Rubber Co., Limited, 212 Upper Thames street, London, E. C. 4, England.

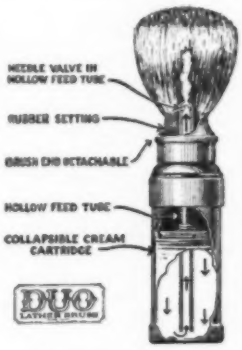
Byer's Patented "Beauty Belle" Massage Outfit

Bristles Set in Rubber in "Duo" Lather Brush

If the "Duo" lather brush becomes as popular as its sponsors would like, no counter carrying supplies for the traveling man or the barber shop will be without it.

The bristle knot is a combination of badger hair and bristles set in rubber and detaches for cleansing and sterilizing, making it particularly desirable for barber shop use. Extra knots sold separately permit each patron to have his own.

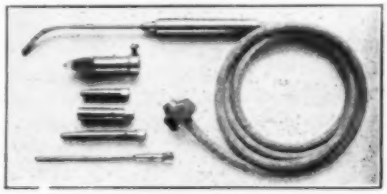
A collapsible tube of one of four well-known brands of shaving cream fits snugly into the handle which is a hollow, nickel-plated white metal tube, with a detachable cap on the lower end. A threaded hollow feed runs through the center, passing through the rubber setting into the bristles themselves. A needle valve in the upper part of this feed stem controls the flow of cream, and a ventilated metal cover protects the brush.—De Luxe Brush Co., Philadelphia, Pennsylvania.



Cut-Away View

Acetylene-Torch Outfit Uses Rubber Tubing

The "Torit" acetylene torch outfit illustrated here uses five feet of rubber tubing, and is provided with four different tips, soldering copper, and connection for auto acetylene tank. It is intended for light repair work in garages, service stations, etc., and produces an instant hot flame without air pressure.—St. Paul Welding & Manufacturing Co., 164 West Third street, St. Paul, Minnesota.

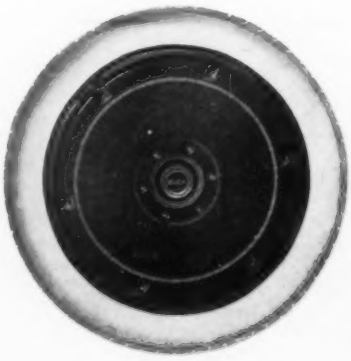


"Torit" Acetylene-Torch Outfit

New Type of Wood Wheel Gaining Popularity

The Smith "Woodisk" wheels for automobiles and trucks are made of laminated wood, where the grain of each layer runs in a different direction. This type of wheel is, it is claimed, four times as strong as the ordinary style manufactured, particularly in regard to side stress—that is, skidding. Drivers of trucks should appreciate this feature of unusual strength, as truck parts must be fashioned to undergo very hard usage.

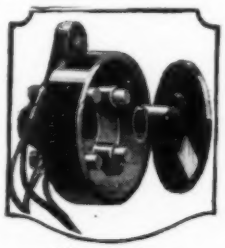
Among the other features is the fact that it is easy to inflate the tire, as the cap is snapped out and the air tube nozzle attached from the outside of the wheel. Also no special hub is required, while the expense and inconvenience of carrying an extra wheel is obviated; only a spare metal rim and tire are needed.—George W. Smith & Co., Inc., Philadelphia, Pennsylvania.



Smith "Woodisk" Wheel

Timer with Hard Rubber Shell

The "Spad" timer for Ford cars consists of two parts, the shell proper and the rotor. The shell is molded of fine hard rubber insulating compound.—Spad Manufacturing Co., Inc., successor to the Omar Tire & Rubber Co., 42 West 39th street, New York, N. Y.



"Spad" Timer

"Sunday" Poker Chips Odorless

Rubber poker chips that are odorless are being put on the market under the name "Sunday." They are noiseless, unbreakable, and washable, and come packed in a carrier containing 50 white and 25 each red and blue.—Jostam Manufacturing Co., 1038 Montana street, Chicago, Illinois.

All-Rubber Bathing Slippers

One of the surf bathing shoes made popular last summer is here pictured. It is made of colored rubber without fabric, and cured on a perfectly modeled last. The stock is calendered with an imitation leather grain. The sole and vamp are of the same quality of rubber, the inner surface of the sole is faced with white rubber. The trimming strips also are of white rubber.

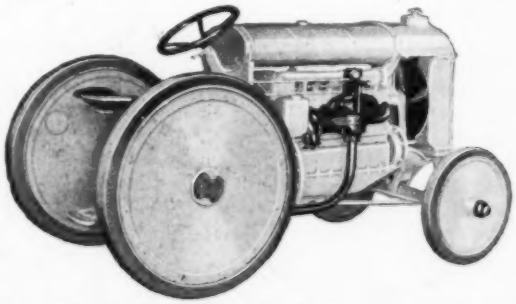
Evidently the shoe was not designed by a shoemaker or the upper would have been joined with a heel seam rather than in the center of the vamp where faulty workmanship more easily mars the appearance of the goods.

The "Artco" bathing slippers are made in six different colors, in sizes from child's No. 11 to men's No. 11.—The American Rubber & Tire Co., Akron, Ohio.

"Artco" Bathing Slippers

Rubber-Tread Tractor Wheels

The illustration shows the inside and outside appearance of the "W.&K." rubber-tired disk wheels used on the Fordson tractor. On the rear 40 by 5-inch standard solid truck tires are used and on the front 24 by 3½-inch industrial tires. These are all of the pressed-on type. The wheels are of hollow cast disk construction and the rear ones may be loaded to give sufficient weight for traction. Generally steel punchings or cast-iron borings are used and the wheels so loaded weigh about 1200 pounds each. Pneumatic tire equipment has been used on the Fordson tractor but is not considered satisfactory. A new design is being developed which will make such tires unnecessary even on rough going.—Whitehead & Kales Co., Detroit, Michigan.



Fordson Equipped with "W.&K." Rubber-Tread Disk Wheels

Bubbles of Rubber

Toy shops and dealers in novelties will welcome "Rubber Bubbles," an interesting development of the familiar balloon. The balloons are fitted with a new type of wood valve having a cork stopper operated by air pressure. The valve has a groove at the edge depressed just enough to accommodate a rubber band to keep the balloon from slipping off. With the balloons, of which there are four in a set, is furnished a small wooden pipe, also fitted with a perforated rubber cap. The balloon is inserted within the opening and can then be inflated and deflated at will. After inflation, each "bubble" may be removed and air-floated, the valve retaining the air within.—The Schaefer Rubber Co., 16 East Fourth street, Cincinnati, Ohio; 29 East Grand River avenue, Detroit, Michigan.

"Rubber Bubbles"

Antipneumatic Ear-Massage Device

A new apparatus said to afford prompt relief to those who have suffered for years from deafness of the middle ear employs the "Theraphone" antipneumatic earpiece of hard rubber, in several parts. Within this the diaphragm is seated on soft rubber cushions, and the vibration principle utilized is entirely different from that employed by so-called pneumatic ear-massage devices A special atomizer is also used to effect the recommended treatment, in spraying the passages inside the head with a mixture of softening oils before the "Theraphone" is applied and the knob at the end of the box is turned to operate the battery within. The illustration shows the Theraphone earpiece resting in its box but it is removed and held to the ear when used.—The Evolution Phone Co., Inc., 48 Greenwich avenue, New York, N. Y.

Pape "Theraphone" Ear-Massage Apparatus

Rubber Sandal That Fits Snugly

"Snugs," rubber sandals for women, feature the flexible knurling that curls over the edge of the shoe, regardless of shape. They are made in one last and five sizes, and the dealer is provided with an attractive, compact counter-display case.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.

"Snugs"

Vermilion Ball

A vermilionized rubber ball, without paint or varnish, is a novelty recently placed on the American market. The new ball is a deep rich crimson red, brilliant and non-fading, the kind that is especially attractive to children.—The Miller Rubber Co., Akron, Ohio.

Activities of The Rubber Association of America

Mechanical Goods Specifications

THE Federal Specifications Board was recently established in Washington, the purpose of which is to prepare specifications for many of the articles purchased by the governmental departments and bureaus. This board appointed a subcommittee on Specifications for Rubber Goods, of which P. L. Wormley of the Bureau of Standards is chairman. Dr. S. W. Stratton, chairman of the Federal Specifications Board, has been advised that the Mechanical Goods Specification Committee of the Rubber Association is anxious to cooperate in drafting those specifications which the government needs. This offer has been accepted and both committees will keep in close touch in the matter.

Mechanical Goods Specification Committee Elects New Officers

At the January meeting of the Mechanical Division no meeting of the Specification Committee was held, consequently the election of officers by that committee was deferred. At the meeting held March 8, at New York, the officers elected are W. H. Cobb, of the United States Rubber Co., chairman, and W. W. Evans, of The B. F. Goodrich Co., vice-chairman, successors respectively to J. W. Fellows and W. H. Cobb.

Response to 1921 Questionnaire—Second Half

The questionnaires calling for general information concerning the operations of firm members during the second half of 1921 are still being received, but so slowly that the delay caused in compilation will considerably diminish the usefulness of the data when distributed. All companies who have not yet supplied the information asked for in the questionnaire, which was distributed early in February, are urgently requested to give the matter of reply their immediate attention for the mutual benefit of the association membership.

Solid Tire Manufacturers' Committee

At the February meeting of the Executive Committee of the Tire Manufacturers' Division it was decided to form a Solid Tire Manufacturers' Committee in order that special attention may be given to problems involved in the manufacture and distribution of solid tires, which do not occur in connection with pneumatic tires. The membership of this committee includes every member of the Tire Division who produces solid tires. The work of the committee will probably not require as much time and attention as is given to pneumatic tire matters, but it will be relatively as important. Solid tire subjects can now be handled separately from other tire interests more quickly and satisfactorily than heretofore.

Patent Office Fees Increased

The Act of Congress approved February 18, 1922, amends Section 4934, Revised Statutes, so as to provide a fee on filing each original application for a patent, except in design cases, of $20 instead of the present fee of $15.

The Act also provides, in addition to the present fees for recording assignments or other papers, that there shall be paid for each additional patent or application included or involved in one writing, where more than one is so included or involved, 25 cents additional. These new fees are effective on and after April 19, 1922.

Applications for patent, except in design cases, received on or after April 19, 1922, with only $15 filing fee, will not be entered, but will be given a filing date and serial number as of the day the full fee of $20 is received by the office.

Reduced Carload Rates on Solid Truck Tires to Pacific Coast Ports

Heretofore the carload rate on solid truck tires from Atlantic to Pacific Coast ports via steamship lines, via the Panama Canal route, has been $1.25 per 100 pounds.

The Traffic Committee of the Rubber Association placed before the Atlantic Intercoastal Conference a request for reduction in the rate to $1.00 per 100 pounds, stating that this would stimulate the movement of solid truck tire tonnage via the steamship lines.

The association is now informed that the reduced rate of $1.00 per 100 pounds became effective March 17, in connection with the water lines operating from Atlantic to Pacific Coast ports via the Panama Canal.

Schedule of Meetings

Regular meeting of the Executive Committee of the Tire Division Wednesday, April 19, at The Rubber Association office.

Regular meeting of the Board of Directors at the Lotos Club, New York, N. Y., Thursday, April 20.

A meeting of the Foreign Trade Division will be held in Washington in April at dates to be determined later.

General manager A. L. Viles will attend the conference called by Secretary Hoover on statistical work to be held in Washington, D. C., April 22.

Elections and Appointments

In order to fill three vacancies in the board of directors of The Rubber Association of America, the following were recently elected, and will serve until the next annual meeting of firm members in January, 1923: G. M. Stadelman, vice-president, of The Goodyear Tire & Rubber Co., succeeding E. G. Wilmer of that company; F. A. Seiberling, president, of the Seiberling Rubber Co., succeeding himself; and G. B. Dryden, president of the Dryden Rubber Co., succeeding J. W. Maguire, president of the Maguire Tire & Rubber Co.

E. M. Bogardus, comptroller of The Fisk Rubber Co., has been appointed assistant treasurer of The Rubber Association of America, and will serve during the year 1922.

INNER TUBES AS SURF BOARDS

The Hawaiian Islands' sport of surf-board riding has its rival in riding the waves of the Pacific Coast on inner tubes. Originally used by bathers to buoy them while learning to swim, inflated inner tubes are now considerably employed in a more exhilarating diversion, that of surf-riding.

One of the cleverest users of these tubes is the 10-year-old daughter of a prominent rubber man on the Pacific Coast. Even in rough breakers she can balance herself remarkably well while standing on the air-filled ring of rubber. Nor is she particular whether it is red or gray, high or low specific gravity tube, just so long as it floats.

Surf Riding on an Inner Tube

News of the American Rubber Trade

Financial

The B. F. Goodrich Co.

THE balance sheet of The B. F. Goodrich Co., Akron, Ohio, shows, for the year ended December 31, 1921, a reduction of total assets and liabilities to $89,031,229, with current assets totaling $51,644,417. Current liabilities are estimated at $3,413,128, while inventory is shown to have been reduced to $29,618,935. Payments of dividends on the preferred stock and $1.50 per share on the common increased the deficit to $12,511,971, which being charged against the surplus account of previous years has thereby reduced that amount to $10,194,527.

The consolidated balance sheet of December 31, 1921, follows:

ASSETS		1921
Plant		$32,115,759
Investments		4,446,546
Treasury stock		230,600
Current assets:		
Inventory	$29,618,936	
Accounts, etc.	19,408,519	
Liberty Bonds	43,266	
Cash	2,573,696	
		51,644,417
Deferred charges		593,907
		$89,031,229

LIABILITIES		
7 per cent preferred stock		$37,224,000
Common, no par		2,313,999
Employes' stock subscriptions		536,963
Amortization surplus		1,225,064
Current liabilities:		
Accounts payable		3,413,129
7 per cent notes due 1925		30,000,000
Reserves:		
Contingent	$3,316,117	
Other	807,430	
		4,123,547
Surplus		10,194,527
Totals		$89,031,229

Bertram G. Work, president of the company, states that the loss sustained on the past year's operations was due almost entirely to the decline, in 1921, in market values of raw materials and finished goods carried forward from the previous year. It is the opinion of the directors that with the substantial reduction effected in operating costs during the past year the current year's operations should, with a reasonable volume of business, show a fair margin of profit. While capital expenditures have been kept down to the minimum, the company's plants are in excellent condition to take care of a much larger volume of business than represented by 1921 sales, which are estimated at $86,687,339.

The Fisk Rubber Co.

Sales for the Fisk, Federal and Ninigret companies for the year ended December 31, 1921, were $39,269,323, compared with $59,172,358 in 1920, a decrease of 33½ per cent in sales value due to price reductions, but only 2 per cent in unit sales. On this business there was a net profit, after depreciation and rebates due to price revisions, but before interest, of $3,336,467, of which $2,607,432, or over 81 per cent, was earned in the last six months. After deducting interest charges of $1,325,088, an inventory adjustment of $8,390,455, and preferred dividends of $516,915, there remained a surplus balance of $1,873,418, compared with $7,789,085 at the end of 1920.

Current assets were $24,714,834, against current liabilities of $6,386,254, indicating a net working capital of $18,328,580, compared with $20,866,509 for the year before. The balance sheet, as of December 31 last, showed cash, $2,079,214; accounts receivable, $8,718,714; notes receivable, $824,871; deferred charges, $1,419,425, and inventories, $13,060,207. Accounts payable totaled $1,274,588; notes payable, $4,845,000, and depreciation reserve, $4,103,571. Total assets and liabilities were $50,432,507.

Lee Tire & Rubber Corporation

Net sales for the year ended December 31, 1921, were $7,358,436, compared with $6,705,929 in 1920, a gain of 10 per cent. Net profits after deducting all charges were $249,506, against $326,638 in 1920. For depreciation of inventory $240,268 was written off, leaving a balance for dividends of $9,238, equal to six cents a share on the 150,000 shares of common stock, against $2.11 a share in 1920. Dividends of $2 per share have been paid from surplus, reducing the balance to $361,572.

During the year the company liquidated its entire bank debt, the only current liabilities now being monthly bills. As of December 31, 1921, there was $650,000 in cash on hand. The firm is well protected for future requirements of fabric and rubber at present low market values. The number of tires sold during the year represents a gain of 41.6 per cent over 1920 sales, and the gain of 10 per cent in value of net sales was made despite three price reductions aggregating about 43 per cent. Sales to date this year show an increase of 50 per cent in tires and 100 per cent in tubes over the corresponding period of 1921.

The Miller Rubber Co.

Net sales of the Miller Rubber Co. for 1921 were $18,983,677, which is 72½ per cent of the net sales for 1920, amounting to $26,182,391. The volume of tire business during 1921 expressed in commodity units was greater than in 1920 by approximately 5 per cent, with sales in other lines also showing an increase in volume.

Total inventories were reduced from $9,321,803 to $3,981,922 making a total reduction of $5,339,881. The inventories of materials were valued at the lower cost or market prices. Due to declining market prices during the year the company was obliged to absorb $1,633,000 further shrinkage in its inventory values, which together with a provision of $463,000 for loss on 1922 commitments aggregated $2,096,000, all of which was recovered in the operations except the difference in the deficit of $555,000.

After writing down inventories and deducting an amount considered adequate to cover doubtful accounts, discounts and contingencies, the current assets amounted to $7,983,224, less current liabilities of $2,060,437 (all bank indebtedness being paid) which gives the company $5,922,387 for net working capital—or 31 cents on each dollar of the net volume of last year's business.

Dividends Declared

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
Akron Standard Mold Co.	Com.	1% q.	Apr. 1	Mar. 15
Allis-Chalmers Manufacturing Co., Inc.	Pfd.	$1.75 q.	Apr. 15	Mar. 24
Boston Woven Hose & Rubber Co.	Com.	$1.50 q.	Apr. 1	Mar. 20
Brunswick-Balke-Collender Co.	Com.	1¾% q.	Apr. 1	Mar. 20
du Pont, E. I., de Nemours & Co.	Com.	2% q.	Mar. 15	Mar. 4
du Pont, E. I., de Nemours & Co.	Pfd.	1½% q.	Apr. 25	Apr. 10
Firestone Tire & Rubber Co.	6% Pfd.	1½% q.	Apr. 15	Apr. 1
Firestone Tire & Rubber Co.	7% Pfd.	1¾% q.	May 15	May 1
General Electric Co.	Com.	$2.00 q.	Apr. 15	Mar. 8
General Tire & Ruber Co., The	Pfd.	1¾ q.	Apr. 1	Mar. 20
Goodrich, B. F., Co., The	Pfd.	$1.75 q.	Apr. 1	Mar. 22
Hood Rubber Co.	Com.	$1.00 q.	Mar. 31	Mar. 25
Hood Rubber Products Co., Inc.	Pfd.	1¾% q.	Mar. 1	Feb. 20
Kelly-Springfield Tire Co.	6% Pfd.	$1.50 q.	Apr. 1	Mar. 20
Salmon Falls Manufacturing Co.	Com.	$2.50 q.	Mar. 1	Feb. 20
Traveler Rubber Co.	Com.	8% ..	Apr. 15	...
United Shoe Machinery Corporation.	Com.	$0.50 q.	Apr. 5	Mar. 14
United Shoe Machinery Corporation.	Pfd.	1½% q.	Apr. 5	Mar. 14
Westinghouse Electric & Manufacturing Co.	Com.	$1.00 q.	Apr. 29	Mar. 31
Westinghouse Electric & Manufacturing Co.	Pfd.	$1.00 q.	Apr. 15	Mar. 31

New Incorporations

Allen Rubber Corporation, February 23 (New York), $30,000. H. Perlitch; A. Levy; M. Greenberger—all of 1133 Broadway, New York City. To deal in tires.

Associated Motor Service Co., The, February 23 (Ohio), $10,000. N. H. Offmeister; A. E. Brencken; W. B. Lemmos; F. P. Ables; F. E. Hill. Principal office, Cleveland, Ohio. To manufacture and deal in tires and tubes.

Brolah Co., The, February 25 (Ohio), 500 shares, no par common stock. C. W. Wright; O. Talmadge; H. A. Sullivan; M. M. Greenberger; J. D. Hotchkiss; J. B. Keller—all of Akron, Ohio. Principal office, Akron, Ohio. To manufacture rubber or any of its allied products and all things containing rubber.

Combined Tires Sales Association, March 7 (Delaware), $100,000. F. L. and M. E. Mettler; P. M. Gilkey—all of Wilmington, Delaware. Delaware agent, F. L. Mettler, 832 Market street, Wilmington, Delaware. To manufacture and deal in tires and accessories.

Eastburn & Sharpless, Inc., February 20 (Delaware), $500,000. H. G. Eastburn; M. E. Doto; E. M. Craig—all of Wilmington, Delaware. Delaware agent, H. G. Eastburn, Room 700, Ford Building, Wilmington, Delaware. To manufacture and deal in tire valves.

Florence Webbing Corporation, March 1 (New York), $20,000. E. Krenz; L. J. Warener; W. H. Downing—all of East Rochester, New York. Principal office, East Rochester, New York. To manufacture webbing, woven fabrics, etc.

General Tire Co., February 21 (Tennessee), $25,000. W. F. Murphy; W. Pate; D. P. McEwin; W. H. Kirkpatrick; B. Douglas. Principal office, Nashville, Tennessee. To deal in tires and accessories.

Goodyear Rubber Coat Co., Inc., February 23 (New York), $5,000. I. R. Ballin, 778 DeKalb avenue; F. and S. Zasuly, both of 293 Division avenue —both in Brooklyn, New York. To manufacture waterproof apparel.

Heavy Duty Apron Co., The, February 4 (Ohio), $5,000. E., L. H. M., and S. Arenson; M. Wise. Principal office, Akron, Ohio. To manufacture rubber aprons, sheets, etc.

Hubbell Rubber Co., March 11 (Delaware), $600,000. M. L. Rogers; M. M. Nichols; W. G. Singer—all of Wilmington, Delaware. Delaware agent, Corporation Registry Co., 100 West 10th street, Wilmington, Delaware. To manufacture and deal in tires, etc.

International Rubber Co. of America, March 13 (Delaware), authorized capital, 200,000 shares without nominal or par value. C. B. Outten; S. L. Mackey; L. C. Christy—all of Wilmington, Delaware. Delaware agent, Corporation Service Co., Equitable Building, Wilmington, Delaware. To manufacture, repair and deal in tires, tubes, etc.

Kenyon Co. of California, C., March 14 (Delaware), $25,000. R. Goldman; A. G. Thaanom; H. G. Liese—all of 120 Broadway, New York City. Delaware agent, Registrar and Transfer Co., 100 West 10th street, Wilmington, Delaware. To manufacture and deal in tires, tubes, etc.

Kroydon Co., The, March 3 (New Jersey), $500,000. A. A. Kreuter; C. L. Gairoad; G. Norris—all of 563 Eighteenth avenue, Newark, New Jersey. Principal office, 563 Eighteenth avenue, Newark, New Jersey. Agent in charge, A. A. Kreuter. To manufacture and sell golf balls, etc.

Lawrence Carrier Corporation. February 13 (Delaware), $500.00. T. L. Croteau; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To deal in tire racks and tire carrying devices.

Linatire Products Co., The, February 8 (Ohio), $10,000. S. D. Stanson; R. G. Thomas; D. C. Murphy; A. C. Littell; L. E. Mentzer. Principal office, Akron, Ohio. To manufacture and deal in tires and tire repair equipment.

Motor Tire Co., January 10 (Colorado), $10,000. H. J. Gast; J. P. Musgrove; J. I. Gilbert. Principal office, Denver, Colorado. Agent in charge, J. I. Gilbert, 2729 West 36th avenue, Denver, Colorado. To deal in tires.

Perfect Auto Rim Co., February 25 (Delaware), $500,000. M. L. Rogers; L. A. Irwin; W. G. Singer—all of Wilmington, Delaware. Delaware agent, Delaware Registration Trust Co., 100 West 10th street, Wilmington, Delaware. To buy, sell and deal in rims.

Pioneer Rubber Co., February 28 (Massachusetts), $10,000. E. C. Matthews, president and director; L. L. Merritt, treasurer, clerk and director; A. J. McManus, director—all of 54 Commercial street, Worcester, Massachusetts. Principal office, Worcester, Massachusetts. To manufacture and deal in rubber goods, etc.

Queen City Rubber Co., The, February 2 (Ohio), $10,000. C. F. Davis, Jr., president; L. D. Davis, vice-president, both of 3641 Zumstein avenue; C. F. Davis, treasurer, 2130 St. James avenue; J. Surtees, secretary, care of Westinghouse Lamp Co.—all of Cincinnati, Ohio. To manufacture and deal in rubber goods. (Formerly the Cincinnati branch of the General Rubber Goods Co.)

S. & W. Tire & Rubber Co., January 6 (Illinois), $5,000. E. C. and C. E. Silldorf, both of 1753 Jarvis avenue; E. H. Silldorf, 2012 Lunt avenue—both in Chicago, Illinois. Principal Office, Chicago, Ills. To deal in tires and accessories.

Semon Gasoline & Tire Co., March 13 (New York), $5,000. I. Sevin, 179 Delancey street; H. and F. Monastirsky, both of 62 Attorney street—both in New York City. To deal in tires, etc.

Spad Manufacturing Co., Inc., February 8 (New York), $100,000. H. L. Bair, president; L. J. Bair, vice-president and general manager; R. Buxton, secretary and treasurer. Principal office, 42 West 39th street, New York City. To manufacture a hard rubber specialty. (Successor to The Omar Tire and Rubber Co.)

Stoneham Tire Co., Inc., February 11 (Texas), $5,000. J. A. Stoneham, president; J. J. Bunn, vice-president; J. J. Stoneham, secretary and treasurer. Principal office, Clarksville street, Paris, Texas. To deal in tire and tubes.

Tape Tire Corporation, February 1 (Washington), $1,250,000. F. B. Carlisle; H. C. Sampson; T. J. Appleton, Sr. and Jr.; B. Embree. Principal office, Seattle, Washington. To manufacture and deal in tires, tubes, etc.

Tire Shop, Inc., The, March 7 (New York), $50,000. N. R. Tarrant; C. H. Rork; F. P. Moynehan—all of Glens Falls, New York. Principal office, Glens Falls, New York. To deal in tires, etc.

Tire Supply Co., The, February 20 (Ohio), 200 shares no par value. J. A. Elden; D. N. Grill; G. T. Strapp; M. H. Burns; M. H. Champ. Principal office, Cleveland, Ohio. To manufacture and deal in tires, etc.

Tru-Matic Tube & Tires Sales Co., of Ohio, February 24 (Ohio), $150,000. D. Klein; W. H. Dettelback; E. D. Parsons; F. W. Milton; E. A. Campbell. Principal office, Cleveland, Ohio. To deal in tires, tubes, etc.

Tubeless Pneumatic Tire Sales Corporation, March 3 (New York), $250,000. W. K. Ross, 245 Huron street, Brooklyn; A. S. Roberts, 130 West 42nd street; H. A. Dinger, 4293 Vireo avenue, both of New York—both in New York. To deal in tires, etc.

Turner Wheel Corporation, Inc., March 18 (New York), $300,000. H. W. Bank; E. W. Burr; E. J. Wolfson—all of 149 Broadway, New York City. To manufacture tires, etc.

Union Rubber Products Corporation, February 2 (New York), $5,000. P. R. Fernald, president; H. F. Schrader, vice-president and treasurer; R. C. Smith, secretary. Principal office, 110 West 40th street, New York City. To sell and deal in and with all commodities in the mechanical rubber goods line, excepting perforated mats and matting.

United Rubber Corporation, January 9 (Maine), 1,000 shares no par value. E. J. Warren, president and treasurer, Bangor; D. I. Laffin, clerk, Portland—both in Maine. Principal office, Portland, Maine. To deal in automobile supplies and accessories.

Wolfelt Co., Inc., C. H., March 8 (Delaware), $400,000. T. S. Buckingham; C. I. Brown; J. L. Watson—all of New York City. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To buy, sell and deal in rubber, leather, etc.

Yield-Wheel Corporation, February 11 (Maine), $200,000. H. Mitchell, president and clerk; D. E. Phillips, treasurer—both in Kittery, Maine. Principal office, Kittery, Maine. To manufacture and deal in tires, etc.

The Rubber Trade in the East and South

Manufactured Goods

Mechanical rubber goods factories report a steady although slow increase in orders as industrial lines in general develop spring activity. The seasonal lines of jar rings and garden hose will maintain the present capacity output for about two months at least before the slack season arrives. Heels are being produced in large volume. This line has increased in popularity with rubber manufacturers and is attracting new capital for its development.

The output of automobile tires is gaining in volume and cord tires continue to gain in favor over fabric tires. Makers are stressing development of cords for quality and increase of service. In automobile topping conditions are fair and improving slowly. The same may be said of insulated wire production. The rubber footwear companies are busy on tennis, sport and canvas shoes particularly. Tickets on other lines are reduced considerably below capacity as the consuming season is practically over. Druggists' sundries, balls, toys, novelties, etc., are in fair production. In all lines the feeling is general that trade conditions are steadily improving.

Association of New York Rubber Brokers

An organization to be known as The Association of New York Rubber Brokers has been recently formed, with the following as officers: R. L. Chipman, president; H. W. French, vice-president; C. A. Morse, secretary; and A. C. Spencer-Hess, treasurer. The governing committee consists of the above executives, and in addition R. W. Earle, G. E. Pell and M. Rothschild.

While the brokers united in this enterprise have in mind the general welfare of the rubber trade they are particularly desirous of promoting the relationship between dealers and brokers, for their mutual protection, and of establishing an organization which may render more efficient and reliable service to dealers and importers.

One of the special objects of this association is the preparation of a standard form of contract for sales between dealers and importers. Another is the fixing on a uniform charge for brokerage, and for this a rate of $4 a ton was adopted.

New York

The firm formerly known as F. R. Henderson & Co., 111 Broadway, New York, N. Y., has been succeeded by a corporation under the name of F. R. Henderson & Co., Inc., of which Francis R. Henderson is president, Harold H. Henderson and Bancroft W. Henderson are vice-presidents, and H. J. Hoyt is treasurer.

A. I. Butler has been recently appointed district sales manager of the New York City branch of the Brunswick-Balke-Collender

Co., 623-633 South Wabash avenue, Chicago, Illinois. J. B. Linerd is general manager of the company's tire division.

The Pioneer Asphalt Co., Lawrenceville, Illinois, has recently opened, in addition to its warehouses at Boston, Chicago, Trenton, and Cleveland, an eastern district sales office at 1674 Broadway, New York, N. Y., with John F. Donovan in charge. Mr. Donovan who was previously associated for several years with the United States Rubber Co., is thoroughly familiar with rubber goods manufacture, and with the special uses of mineral rubber, in the production of which the Pioneer company specializes. J. K. Riley is sales manager of the organization.

The Advance Manufacturing Company announces a change of its firm name to Toddy Rubber Manufacturing Company, with address 98-100 Park Place, New York, N. Y.

Charles S. Leslie

Charles S. Leslie, a broker in crude rubber and located at 24 Stone street, New York, N. Y., will celebrate in April the twenty-fifth anniversary of his connection with the rubber trade. Mr. Leslie has been associated successively with Reimers & Meyer, Poel & Arnold, Arnold & Ziess, and Poel & Kelly as sampler and examiner, dock shipping clerk, and traffic manager. Since 1918 he has been in the brokerage business on his own account, and now specializes for both manufacturers and importers.

R. T. Vanderbilt Co., Inc., 50 East 42nd street, New York, N. Y., announces the establishment of a laboratory equipped with apparatus and personnel, under the direction of Dr. A. A. Somerville, to do rubber experimental work. The facilities of this laboratory are offered gratis to manufacturers who do not have their own experimental equipment.

At the recent annual meeting of the stockholders of the Kelly-Springfield Tire Co., Seventh avenue at 57th street, New York, N. Y., the old board of directors was reelected, while four new members were also added. This increase includes vice-presidents of the organization who have had for many years practical direction of the company's affairs. The officers for the coming year are not elected until the next meeting of the board of directors. The four new directors are: Clarence A. Brown, Thomas C. Marshall, John V. Mowe, and Maurice Switzer.

J. B. Cothran, formerly with The Fisk Rubber Co., has been appointed sales manager of the New England Tire & Rubber Co., with headquarters at 250 West 57th street, New York, N. Y. Production has increased considerably of late and the company hopes to double the present quantity within the next week or two. Its products are being sold through authorized dealers and distributers who are creating a large market for the "Holyoke Cord" tire.

At the Symposium on Textile Manufacture and Economics held in Philadelphia recently, when fifteen organizations participated, John E. Rousmaniere, of Lawrence & Co., Boston and New York, N. Y., was one of the speakers. Mr. Rousmaniere took as the subject of his address on this occasion, "Cooperation in the Cotton Industry."

CHARLES SCHWEINERT RECOVERS FROM SEVERE ILLNESS

The many friends of Charles Schweinert, president of A. Schrader's Son, Inc., are congratulating this popular executive on his recovery from a severe illness.

Perhaps there is no man in the tire trade who is more familiar than Mr. Schweinert with the growth of this great industry from very small beginnings. When pneumatic tires were first being used on bicycles, Mr. Schweinert, then a very young man, saw the possibilities of the new invention, and finally succeeded in "selling" the idea of a tire valve to George H. F. Schrader, son of the founder of the Schrader firm. For 35 years Mr. Schweinert has continued his connection with this Brooklyn establishment, seeing it grow from a small concern, housed in a small plant, to the present seven-story building, occupying an entire block. In line with the progress of the company, Mr. Schweinert himself advanced from a very humble position to the presidency of the organization.

The Rubber Trade in New Jersey

Manufactured Goods

Compared with thirty days ago it is safe to say that practically every rubber manufacturing plant in Trenton and vicinity is busier. This is true equally as regards both the mechanical rubber goods manufacturers and the plants making only automobile tires and inner tubes. Belated spring orders for garden hose and other seasonable goods have been coming in with requests for early shipment and this before many rubber mills have been able to complete the early season orders for spring shipment. Good orders for fire hose have been received by some of the Trenton manufacturers and a noticeable increase in orders from railroads and other large corporations using mechanical rubber goods is reported. Tire manufacturers locally have all been fairly busy and the indications point to a continuation of this condition. On the whole there is a more cheerful view taken of business conditions in the industry and it is thought by many that within the next sixty days conditions will show still further improvement.

Trenton

The news of the death of John J. Voorhees, president of the Voorhees Rubber Manufacturing Co., was a great shock to all who knew and so highly regarded him. Known personally to every member of the New Jersey Rubber Manufacturers' Association, Mr. Voorhees was not only esteemed but beloved of all. Many of the Trenton manufacturers knew him for twenty years or more, and were bound by very close ties of friendship towards the late rubber manufacturer.

The Acme Rubber Manufacturing Co., Trenton, reports a very satisfactory business in nearly all departments, and is running full time.

The Ajax Rubber Co., Trenton, is now working three eight-hour shifts and the present daily output is fully up to the highest mark reached at any time since January, 1921.

The Crescent Insulated Wire & Cable Co., Trenton, is operating at full capacity and looking forward to an increased demand for its product if labor troubles do not become general among the building trades.

United States District Judge Joseph L. Bodine recently entered an order permitting A. H. Wood, president of the First National Bank of Trenton, and C. Edward Murray, Jr., treasurer of the Empire Tire & Rubber Corporation, who are receivers of the last-named company, to borrow $200,000, needed to take care of the increasing business of the Empire corporation.

The Hamilton Rubber Manufacturing Co., Trenton, is exceedingly busy in its molded hose, fire hose and jar ring departments. A. Boyd Cornell, the enterprising manager of the company, has done much towards developing the business of this company.

C. E. Stokes, president of the Home Rubber Co., Trenton, has returned from a short vacation of two weeks at Camden, South Carolina.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, has just returned from a stay of several weeks at the Florida east coast resorts.

The Joseph Stokes Rubber Co., Trenton, is busy and H. E. Boyer, general manager, is very optimistic regarding improved business conditions.

The Thermoid Rubber Co., Trenton, is conducting an extensive advertising campaign through its distributing agents featuring Thermoid tires. What may be termed the educational method of advertising is being followed, giving detail particulars regarding material and methods of manufacture likely to prove of interest to prospective buyers.

The United & Globe Rubber Co. and the Globe Tire Co., Trenton, report that business is good.

Whitehead Brothers Rubber Co., manufacturer of the well-known "Long Life" brand of steam hose, is enjoying a nice volume of business.

The business formerly known as the United Tire Co., Trenton, is now being conducted by A. F. and H. S. Jemison at 104 East Hanover street, under the firm name of Jemison Brothers, exclusive distributers of Thermoid tires and inner tubes for New Jersey and part of Pennsylvania, and jobbers of all Thermoid products.

The Semple Rubber Co. has purchased from the Bucks County Trust Co., Doylestown, Pennsylvania, the manufacturing plant occupied by this firm at Trenton. The property consists of large brick and steel buildings and railroad sidings. The consideration was about $40,000. The Semple company has been occupying the premises since it started in the rubber business at Trenton.

The Crescent Rubber Co., of 150 East State street, Trenton, has been incorporated with a capital stock of $25,000 to carry on a rubber business. The incorporators are Martin M. Glassman, of 14 Jarvis place; Abe Abrams, 370 South Warren street, and John L. Heher, 460 West Hanover street, Trenton. The latter will act as agent for the company. The concern has purchased a rubber plant on New York avenue, Trenton, and will engage in the manufacture of rubber specialties.

New Jersey Notes

The executive offices of Paramount Rubber Consolidated, Inc., have been removed from Philadelphia to the company's factory at Little Falls, New Jersey, and all business will hereafter be directed from the plant address. Property adjoining the recently-enlarged factory has been bought, and ample accommodations are now furnished for the augmented staff, which includes the following executives: Lee H. Heist, president; John Roberts, vice-president; and Fred T. Roberts, secretary-treasurer. Thomas Stokes, J. H. Rosenfield, J. H. McBean and W. E. Bobus constitute the board of directors. The company, which specializes in the production of all kinds of play balls, also manufactures certain kinds of druggists' rubber sundries, and inner tubes for automobiles.

Jean Michelin, son of André Michelin, of Michelin & Cie., Clermont-Ferrand, France, is in this country making a study of factory conditions in the United States. He was delighted with the living conditions of the employes of the Michelin plant at Milltown, New Jersey, where most of them are in detached houses or bungalows providing plenty of light and fresh air. While here Mr. Michelin is the guest of his cousin, J. Hauvette-Michelin, head of the Michelin interests in America. He is accompanied by French experts who will study American methods for improving the condition of tuberculosis sufferers.

The Michelin Tire Co. is offering sixty-five prizes, the first of which is $1,000, for a more suitable name for the man whose picture appears on the Michelin posters. The man is known as Bibendum, which is a Latin word for, "We ought to have a drink." The company wants a new name and a slogan, and is willing to pay a large sum for it. The contest closed March 25.

The Bloomingdale Rubber Co., 501 Fifth avenue, New York, N. Y., maintains two reclaiming plants, one at Butler, New Jersey, and the other at Chester, Pennsylvania, both of which have been manufacturing "Pahrah" grades of reclaimed rubber. While the production at the Chester factory will be continued, extensive alterations have been made at the Butler plant, and the most modern type of machinery installed, with a view to manufacturing rubber heels, to be known as "Carlton" heels. W. E. Kavanagh has been appointed technical manager of the Butler plant, and John J. Batterman will act as exclusive selling agent, with headquarters at the company's Boston office, 139 Lincoln street.

Egbert K. Price, trustee in bankruptcy of the Stockton Rubber Co., Stockton, New Jersey, will sell on April 18 the lands, factory buildings, office fixtures and machinery; also all manufactured, reclaimed, and crude rubber.

The Rubber Trade in Rhode Island

Rubber interests throughout Rhode Island are facing industrial conditions that are far from encouraging, notwithstanding the optimistic spirit that is being generally shown among the manufacturers. Practically every one of the rubber plants of the state is being operated by the smallest number of employes, working the shortest number of hours of any period since before the outbreak of the World War. The past year has proved a trying one to both employers and employes alike, and unless there is a decided improvement in the order situation within the next few weeks there is a probability of a general shut-down on the part of the rubber factories of Rhode Island until conditions improve.

As yet the textile strike which began about the middle of January has not materially affected the rubber industry here, although all the tire fabric plants located in the Blackstone and Pawtuxet valleys are closed. At the time of the shut-down, however, only a few of these were actively working on tire fabrics and generally speaking there was sufficient stock on hand to meet all ordinary demands. The opening of spring is expected to accelerate the demand for tires and this activity will be reflected in the call for the products of the cotton mills.

The open weather conditions of last winter and the comparatively similar conditions which prevailed up to the middle of February this winter, called for but little movement in rubber shoes and arctics. The result was that the stocks in the hands of the retailers and jobbers had been but slightly depleted, in consequence of which replacement orders have been received in small number by the manufacturers and the plants have remained dormant. About the middle of February, however, the heaviest snowfall in several years was experienced throughout New England and its influence was manifested in evidences of an awakening in the demand for rubber footwear. Yet, while "one swallow maketh not summer," neither has one snow storm proved sufficient to materially affect the wheels of the rubber industry, but it is expected that it will assist in eventually starting things.

The Alice Mill of the Woonsocket Rubber Co., at Woonsocket, Rhode Island, went on a five-days-a-week schedule January 30, and on February 27 this was again cut to four days a week. The four-day schedule was continued throughout the month of March, and indications are that it may have to be further continued for an indefinite period.

The Millville Mill, of the same corporation, located at Millville, Massachusetts, which has been operating on a four-day schedule for some time, will remain on that basis until further notice. Both of these plants are in the footwear division of the United States Rubber Co., the Alice Mill producing rubber shoes and employing approximately 800 hands, while the Millville plant has about 600 hands employed in the manufacture of lumbermen's boots and arctics.

The receiver of the American Wringer Co., Woonsocket, Rhode Island, has been granted permission by the Superior Court of Providence County to sell the stock and assets of the Eclipse Mercantile Co., and to compromise and settle certain claims. A

rumor that the American Wringer Co. had made an extensive wage cut among its operatives was emphatically denied. A readjustment in the scale has been made whereby some of the departments will receive a lower rate of wages, while others will receive either a higher rate or continue at the same rate so that a balance will be maintained. The prospects for the future are encouraging and the plant is now operating with approximately 450 hands, which is practically one-half the normal complement. Production is said to be about two-thirds normal.

Three promotions were recently announced in the factory staff of the National India Rubber Co., Bristol, Rhode Island; Clarence W. Hugbee to be chief inspector of the wire department; M. J. McGuigan, general foreman of the finishing and spark-testing department, will work in the technical department; Henry L. Yater, assistant foreman of the finishing department, under Mr. McGuigan. Woodbury S. Polleys, until recently purchasing agent of the National company, has resigned to take a position in the general purchasing department of the United States Rubber Co., and James S. Perry, manager for the National company's storehouse at Providence, has resigned to accept another position.

Charles J. Davol, head of the Davol Rubber Co., is a breeder of pedigree cattle and has in his prize herd on his farm "Wild Acres," in the South County of Rhode Island, a cow called "Bess of Perley Farm" whose record of 11,620 pounds of milk yielding 737.67 pounds of butter fat for the year just closed, entitles her to one of the American Jersey Cattle Club's gold medals. This is the third annual test in each of which she has made a most creditable record.

The contract has been awarded and work is to be commenced at an early date, for a two-story addition to the plant of the Davol Rubber Co., Providence. The new building will be of brick, full mill construction and will be 60 feet in length and 40 in width.

The minstrel company of the Davol Rubber Company Mutual Benefit Association staged a benefit show in Altair Hall two evenings last month for charitable purposes. The program was in two parts, in which Messrs. Walter L. Davol, Poultney, Galligan, Feeney and Beuren and Misses Silva and Beaudette were principals. A. D. McQuarrie was director of the show.

The Rubber Trade in Massachusetts

Manufactured Goods

Factory operations are at present somewhat spotty, some plants running at or very near capacity, while in others production has dropped from 20 to 25 per cent during the past month. Tire production is on the increase and plants now running at 75 per cent normal are expected to reach full capacity in April or May. Increased trucking has stimulated the demand for giant pneumatic and solid tires. Except for seasonal activity in jar rings and garden hose, mechanical rubber goods output does not average above 60 per cent normal, although manufacturers are optimistic regarding the near future.

The late winter demand for druggists' sundries has been good, and business for the first quarter of the year has been better than for two years past. Increasing activity in building and power plant development is strengthening the fair demand for insulated wire and cables which has been well maintained in recent months. The call for automobile topping improves slowly but steadily, while business in waterproof clothing continues quiet.

Footwear manufacturers are busy on rubber-soled canvas shoes and are anticipating a big year, especially in white sports shoes and bathing shoes of many colors. In at least one instance factory production has been sold out for the season, while other companies still complain of late ordering. The biggest delay on the part of retailers, however, is in ordering gum footwear, and if this continues, long summer shut-downs and autumn shortages are inevitable.

Rubber heels continue in large demand and volume production. Many shoe makers are equipping two-thirds of their output with them. Rubber-soled sport and also many comfort shoes have rubber heels, and a Lynn manufacturer is now putting them, for the first time, on patent leather oxfords. Women are wearing rubber heels more than ever before because of the vogue for low-heeled sport shoes on which top lifts of rubber are practical. Heel-nailing machines in shoe factories are now being adjusted to nail either leather or rubber heels, doing away with hand nailing.

Boston Automobile Show

The Automobile Show held at Mechanics' Building from March 11 to 18, inclusive, was of more than ordinary interest, and exhibitors generally regarded the show as encouraging, based on actual and prospective business.

None of the larger tire and rubber companies exhibited directly, although the products of several were noticeable in the displays of accessories. Grow tires were shown by the Grow Tire Co.; Lambert Trublpruf tires by the Lambert Trublpruf Tire Co.; Hanes tires and tubes by the Basseck Manufacturing Co.; Sewell cushion wheels by the Sewell Cushion Wheel Co.; Ball tires by the Simplex Pneumatic Tire Co., and tires of various popular makes by the Central Automobile Tire Co.

A. Schrader's Son, Inc., showed tire valves, pressure gages and other accessories; the Harris Co., Inc., valve inserts and caps, and the Trexler Co., tire valves, tools, chains and pumps. Tire paint and cements were offered by the Boston Blacking Co. and the Instant Products Corporation. Tire tools were displayed by the Coward Auto Supply Co., tire straps by The Russell Manufacturing Co., and tire carriers by the Metal Stamping Co. and the New Era Spring & Specialty Co.

Air compressors and sundries were demonstrated by F. J. Dansingburg, Curtis Pneumatic Machinery Co., Brunner Manufacturing Co., Eggleston Supply Co., W. J. Connell Co., and the Utica Compressor Co., Inc. The Manley Manufacturing Co. offered forcing presses and other garage equipment, and storage batteries were shown by the American Storage Battery Co., Marko Storage Battery Co., Jackson Electric Co., United States Light & Heat Corporation, New England Velie Co., Morlite Storage Battery Co., and the Davis-Lynn Storage Battery Co.

Boston Notes

The annual meeting of the National Association of Cotton Manufacturers, to be held at the Hotel Somerset, Boston, Thursday and Friday, April 27 and 28, starts with a discussion Thursday morning on "The Resources of New England," under the topics Power, Transportation, Manufacturing, and Community Conditions. The Thursday afternoon session will be devoted to a discussion of business conditions under the topics Tariff, Taxation, Foreign and Domestic Markets.

There will be no business session Friday morning, the time being devoted to a harbor trip designed to exploit the advantages of the Port of Boston, and visits to the plants of the Waltham Watch Works, Page & Shaw, Ginn & Co. and the Gillette Razor Co. "Research and Production Costs" will be the subject for discussion at the Friday afternoon session and R. T. Fisher, assistant secretary in charge of research, will speak. The convention will close Friday evening with the annual dinner.

The Marathon Tire Sales Co. has opened a branch at 197 Massachusetts avenue, Boston, and is taking on agents for Marathon tires in various parts of New England. L. Arthur Watkins is New England manager.

The Arco Tire Co., Inc., 679 Beacon street and 204 Columbus avenue, of which Max Leitman is head, is New England distributer for Achilles cord tires.

A. S. Foster, formerly of Lamkin & Foster, and a well-known rubber footwear man, is now associated with the Converse Rub-

ber Shoe Co. at its Boston office, 23 Lincoln street. Mr. Foster has been a leading spirit in the New England Shoe Wholesalers' Association ever since it was organized, and is also a charter member of the Boston Boot & Shoe Club.

The Phillips Rubber Co., manufacturer of soft molded and vulcanized rubber specialties, now has its main office at 10 High street, Boston. The factory is at 36 Whittier street, Roxbury. Benjamin E. Phillips is president and Oliver P. Hussey, secretary and treasurer.

Miscellaneous Massachusetts Notes

The business of Arthur Jackson Wills, manufacturer of the Wills rubber overflow trimmer, at North Brookfield, Massachusetts, has not been influenced by the past year of depression and is increasing steadily with the same personnel.

George E. Hall, president and general manager of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, recounted interestingly his experiences in the devastated areas of France and Belgium at the first get-together meeting of the Bowohoco Club after an interval of eight months. Motion pictures vividly supplemented the address. A chicken dinner was served to two hundred members and an entertainment of songs and stories was much enjoyed. New life insurance policies were presented to 218 employes of the company, making a total of over 800 employes holding such policies.

The Bargains Publishing Co., formerly at 49 Ellery street, South Boston, has purchased a new plant at Essex, Massachusetts, where automobile tire labels, printed sealing tape, etc., will be manufactured. Edward W. Rogers is manager of this organization.

The Brockton Tool Co., formerly at 145 Crescent street, has removed to larger quarters at 103 Belmont street, Brockton, Massachusetts. This organization, comprising I. Sandberg and L. Holmes as firm members, specializes in the manufacture of steel molds for rubber soles and heels.

The Rubber Trade in Ohio

Manufactured Goods

The close of the first quarter of 1922 finds the rubber industry in Akron far advanced over the position held a year ago at this time and also ahead of production registered at the beginning of the present year. A year ago, however, March and early April conditions were very closely comparable with the present in that it was a period of waiting for the coming of spring business in large volumes. Increases in production had been made during the first two months of 1921 and the following month production remained on an even keel, to jump forward during the ensuing quarter.

A year ago The Goodyear Tire & Rubber Co. had speeded production to 60,000 tires a week, or 10,000 a day. At the present time production is easily twice that number. The Miller Rubber Co. was quietly adding men and by April 1, 1921, production was reported to be very close to 50 per cent. Now the same company reports that production is between 80 and 85 per cent. The Firestone Tire & Rubber Co. was leading all other manufacturers in the production of 15,000 tires a day. At the present time Firestone officially reports a production of 18,000 tires daily. The India Tire & Rubber Co. was elated over reaching 65 per cent of normal with hopes of increasing production later. Now it has been on full time for months with some extra night work to meet constantly-increasing demand. The General Tire & Rubber Co. was running 100 per cent and has continued to do so regularly throughout the year.

At the beginning of the present year production was very satisfactory, and during the subsequent period men have been added to working forces so that present production is probably 10 per cent in excess of what it was three months ago. The industry enters the second quarter on a sound basis with inventory, production costs, overhead, bank loans, and prices at rock bottom.

Increased Machinery and Equipment Business

A survey of the equipment manufacturers in the Akron district at the beginning of March showed that much improvement had already been registered during the first two months of the year and that indications are towards a gradual improvement in business. The increased business which increased production in some quarters originated to a large extent in Akron itself, while some has come from manufacturers in other states.

The market for equipment is admitted to be highly competitive, but this is not regarded by the manufacturers as unfortunate because in the steel industry competition is looked upon as healthy and not unusual. Every manufacturer who was asked whether business has shown increase in large amounts or not, expressed the opinion that the day for better business is no longer in the future but is practically at hand. Rubber factories after more than a year and one-half of operation with no new equipment are finding it necessary to buy some equipment, even if only odds and ends for replacements.

The Adamson Machine Co. at its annual meeting late in January issued what, under the conditions, is looked upon as a very optimistic report. In spite of the fact that the company for the first time in more than thirty years showed a small operating loss, this was looked upon by the company as a unique experience and because of a large surplus did not prevent the payment of dividends to stockholders.

Alexander Adamson, the president, in a statement said that although the year as a whole showed a small loss, conditions during the last months of the year had already shown such improvement that small operating profits were shown for these months, which brought the company into the new year on a profitable basis. More work is now being done locally than for a long time and a general revival seems to be in store for equipment manufacturers in general.

The Akron Gear & Engineering Co. reports a distinct upward movement of business originating both in the Akron district and outside. While the business thus far received is for small material it has been sufficient to warrant making plans for a sharp increase in production. During the last month some foreign business has been received, including one order from Australia where conditions are showing improvement.

The Franz Foundry & Machine Co. is encouraged with recent developments, which include more business in February than during any month for the last year and one-half. The plant is operating with one full shift and part of the plant is on a night shift.

At the Akron Rubber Mold & Machine Co., orders during the first two months of 1922 were twice as large as during any month of 1921. The foundry has been placed on a full-time basis for the first time in many months and some of the departments are working a little overtime.

The Williams Foundry & Machine Co. reports that the pickup noted at the plant during January, February and early March amounts to at least 50 per cent over the last months of 1921. The plant has been placed on a 50-hour-a-week basis as compared with 40 hours previously worked in some departments.

The Akron Standard Mold Co. reports that business during January and February exceeded anything received last year. If it keeps up the factory will begin to "look like old times in the very near future."

The Akron Equipment Co. states that, while improvement is gradual and sometimes seems to be standing still, a fairly good business is expected during the present year. The company at its annual meeting reported that while profits to any extent

could not be shown for 1921, the fact that operation was not at a loss with general conditions as they were during the year, is looked upon as propitious.

The Akron Machine, Mold, Tool & Die Co. reports that business materially increased during the latter part of January and the early part of February and that, as a result, part of the plant is working nights with several additions to the working forces.

Akron Notes

The General Tire & Rubber Co., Akron, Ohio, reports new business with more than 200 per cent increase in volume over sales of the first months of 1921, when the output was estimated to be 75 per cent of normal. The company is working upon plans to increase production materially during the next six months.

The B. F. Goodrich Co., Akron, has made some readjustments in the tire department during the past month. Time has been reduced slightly in some departments while in others men were laid off. Most of these, however, were taken on in other parts of the factory so that the net result of adjustments is comparatively small. Goodrich follows the policy of making tires or other rubber products only as fast as actual orders are on the books, and a slight temporary decrease in sales is immediately reflected in factory operations.

The American Rubber & Tire Co., Akron, sold twice as many tires in February as in January, and as orders have continued on this basis during the month of March the company will doubtless find it necessary to add to its working forces soon.

Framework for the National Sulphur Co.'s building at Bett's Corner is up, and it is expected that it will be completed by July 1 at the latest. Bad roads leading to the plant caused some difficulty during the first part of the month. It is expected that 250 men will be employed when the plant is placed in operation.

The Mohawk Rubber Co., Akron, now has one full shift a day in operation and some of the departments are occasionally compelled to work overtime. Orders being received forecast the possible need of a second shift.

The Gregory Rubber Co., Akron, manufacturer of specialties, announces that sales are very satisfactory and have resulted in increasing production by lengthening working hours and also by addition of some men.

C. W. Bedford has withdrawn from the Rubber Service Laboratories Co., to enter the research department of The B. F. Goodrich Co., Akron, Ohio.

The Seiberling Rubber Co., Akron, and Barberton, Ohio, announces the following additions to its executive personnel: W. H. Oburn, manager of credits and collections; H. J. Thompson, manager of heel department; F. R. Griffin, manager of advertising and sales promotion; and H. A. King, manager of tires sales. All these men gained their experiences through previous connection with the Goodyear organization, Mr. Oburn having spent eleven years with that company, at the time of his resignation being secretary of the Goodyear Board of Control.

At the annual meeting of The Miller Rubber Co., Akron, Ohio, March 9, the board of directors was unanimously reelected. The following officers were also reelected for the ensuing year: Jacob Pfeiffer, president; C. T. Grant, vice-president; William F. Pfeiffer, secretary, treasurer and general manager; R. R. Jennings, assistant treasurer; and Charles R. Wetsel, assistant secretary.

At a recent meeting of the directors of the India Tire & Rubber Co., Akron, Ohio, the following officers were elected:

J. M. Alderfer, president; J. K. Williams, vice-president; D. A. Grubb, secretary; and P. C. Searles, treasurer.

The directors in addition to the above are as follows: H. Lloyd Williams, A. T. Kingsbury, W. G. Lerch, C. Fenton, and G. W. Santee.

The United States Government has accepted the semi-rigid dirigible built by The Goodyear Tire & Rubber Co., and the ship will be taken to Dayton, Ohio, as its temporary home. The new ship is one of those having its engines in the cockpit of the car instead of in the outriggers, and the engine connections are such that one or both can be connected with one or both propellers, and a new clutch arrangement makes possible reversing of the engines.

Cleveland Notes

As a sales organization, aiming to give satisfaction to both manufacturer and buyer, and dealing in mechanical rubber goods, automotive equipment, carpets and trim materials, the firm of Paine, Williams & Co., is now operating at 4614 Prospect avenue, Cleveland, Ohio. Officers of the organization are: E. E. Paine, president and treasurer, and F. B. Williams, vice-president.

The Cleveland Wire & Cable Co., with offices and factory at 1679 Collamer avenue, Cleveland, Ohio, is now operating at full capacity. The company was organized about a year ago by Cleveland concerns interested in electrical industry with the purpose of manufacturing a high grade line of weatherproof wire and cable. Officers of the organization include: W. H. Staring, president; P. C. Clark, vice-president; Dudley J. Hard, secretary, and E. H. Smith, treasurer.

Ohio Notes

Production is now being carried forward and reclaimed rubber is being manufactured at the plant of the Electric Rubber Reclaiming Co., Barberton, Ohio. The same firm, operating under the name of the Vul-Tex Co., is also making rubber mats of all kinds, stair treads, sponge rubber and rubber balls, radiator hose, mechanical rubber goods, rubber belts, heels, fiber soles, etc. Executives of the company are: F. W. Albrecht, president; J. M. Sumner, vice-president; J. S. Bruner, secretary and treasurer; and C. A. Sarchet, purchasing agent.

F. F. Dugan has been elected vice-president and director of sales of the Denman-Myers Cord Tire Co., Warren, Ohio, while C. L. Mason has been placed in charge of the company's distributers and branches. J. H. Appleby and J. P. Egan will have charge of field work in Illinois and Ohio. Officials of the Denman company state that their sales record for January and February of 1922 totals more than all of their last year's deliveries. Executives recently elected are: Walter E. Myers, president; F. F. Dugan, vice-president; Walter R. Denman, secretary and general manager; and John E. Morris, treasurer.

At the recent annual meeting of the stockholders of the A-U Tire & Rubber Co., Medina, Ohio, manufacturers of tires, tubes, safety boots, etc., the following officers were elected: R. E. Kimmell, president; D. R. Pelton, vice-president; and R. J. Hyde, secretary-treasurer.

The Ashtabula Tire & Rubber Co., Ashtabula, Ohio, has recently purchased the property of the Pearce Tire & Rubber Co., of the same city, and will begin production at once. Only cord tires, to be known as "Ashtabula Cords," will be manufactured at this plant, which is thoroughly equipped for the purpose. C. J. Davis is president.

The McWade Tire & Rubber Co., with general offices and factory at Garrettsville, Ohio, manufacturing automatically-sealed tubes, maintains a branch office at 243 Virginia avenue, Indianapolis, Indiana. Executives of this company include: J. H. McWade, president; S. H. Bruce, vice-president; and H. G. Vincent, secretary-treasurer.

Flexyde products manufactured by the Marathon Co., Cuyahoga Falls, Ohio, are reported to be finding an excellent market, and while some lines have not shown the advance evinced by others, on the whole increases in demand have been such as to necessitate a material enlarging of manufacturing departments. Automobile tire production has been increased until the plant is now on a schedule that is running well over 70 per cent of normal.

The Rubber Trade in the Mid-West

Monthly Meeting of Mid-West Rubber Manufacturers' Association

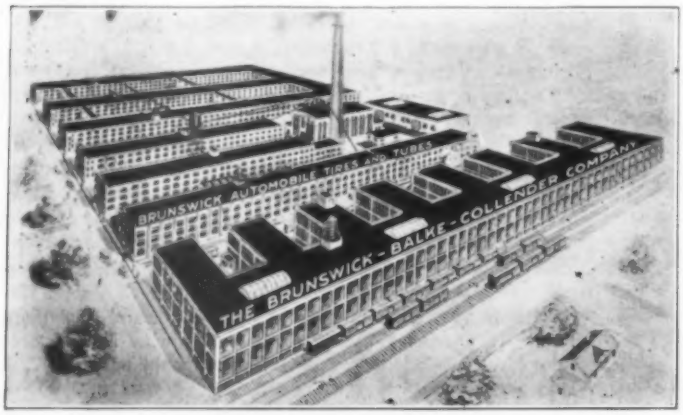
There was a good attendance at the regular monthly meeting and luncheon of the Mid-West Rubber Manufacturers' Association, held at the Hotel Morrison, Chicago, Illinois, March 14. W. W. Wuchter presided, and the principal address was made by O. C. Frisbie, of LaSalle Extension University, who spoke on traffic questions, urging those present to watch their freight rate reductions so that their commodities will be reduced in proportion with the others.

Thomas Whitehead, former president of the National Tire Dealers' Association, made some interesting statements with reference to tire prices and sales, and also remarked on the favorable opinions he had heard expressed regarding The Rubber Association of America's standard tire warranty which has replaced the mileage guaranty. It was also noted that there is at present an unusual demand for tires in the States of Illinois, Iowa and Wisconsin.

At this meeting the Coast Tire & Rubber Co., Oakland, California, was elected to regular membership. Various matters of interest were also discussed, including the proposition to hold meetings every three months, instead of each month, as is now the custom. It was considered advisable, however, to make no change in this matter, and the next meeting will be held on the second Tuesday in April at the Hotel Morrison, Chicago, Illinois.

The Brunswick-Balke-Collender Co.

Few users of Brunswick tires know that the founders of the Brunswick-Balke-Collender Co., 623-633 South Wabash avenue, Chicago, Illinois, were among the pioneers in rubber compounding, and that this organization has been studying methods of rubber manufacture since 1857. At that time a patent was secured for a rubber compound for billiard table cushions, which, essentially the same, is still in use.



The Brunswick-Balke-Collender Co., Muskegon, Michigan

In 1916 this company began, at Muskegon, Michigan, the manufacture of automobile tires and tubes. The plant, originally containing 40,000 square feet of floor space, was enlarged in 1918, 1919, and 1920, the latest addition costing approximately $1,000,000. The company's sales for 1919 were estimated at $25,000,000, as against $12,416,000 in 1918, increasing to $45,000,000 in 1920.

Still further developments in 1919 included the purchase, in different cities, of five new factories, where Brunswick phonographs and phonograph records were to be manufactured, while the company now maintains branch houses in the principal cities of the United States, Canada, Mexico and France. In addition to the products mentioned this organization also specializes in mechanical and hard rubber goods. The executive personnel at present is as follows: B. E. Bensinger, president; B. H. Brunswick, vice-president; Julius Balke, 2nd vice-president; J. C. Schank, treasurer; H. F. Davenport, secretary, and J. L. Deutsch, assistant secretary.

Chicago

George B. Dryden, president of the Dryden Rubber Co., 1014 South Kildare avenue, Chicago, Illinois, has been recently chosen president of the Chicago Athletic Association, an organization with which he has been for some years associated. A photograph and short sketch of Mr. Dryden's activities appear in this association's house organ, *The Cherry Circle*.

In order to handle western trade requirements properly, the New Tread Tire Co., Columbiana, Ohio, has established a branch at 1429 South Michigan avenue, Chicago, Illinois, with R. B. Altenburg and H. B. Gustafson in charge. The company manufactures both cord and fabric tires.

F. M. Root, formerly connected with The B. F. Goodrich Company's Chicago branch, is now manager of the Victor Rubber Co.'s Chicago district, with headquarters at 1720 South Michigan avenue. His territory, comprising the States of Illinois, Iowa, Wisconsin, and parts of Michigan and Indiana, has been extended to include also Minnesota, North Dakota, South Dakota, and Montana.

New Footwear Factory in Illinois

The Servus Rubber Co., with a plant in construction at Rock Island, Illinois, and main offices in the First National Bank Building, Chicago, Illinois, is the only company in the state making rubber and canvas footwear.

The first unit of the new plant, three stories in height, and occupying 60 by 300 feet, will cost approximately $200,000, and will be fully equipped with modern rubber shoe machinery. The company aims to produce, during the first year of operation, at least 3,580 pairs of shoes a day, this being only two-thirds of the plant's 5,000-pair capacity.

Officers and directors of the organization include: Judson J. Adams, president, formerly manager and treasurer of the Beacon Falls Rubber Shoe Co.; Lawrence B. Icely, vice-president, and also president of Thomas E. Wilson & Co.; Irvin S. Rauch, vice-president; Hasbrouck Haynes, treasurer, and also president of Haynes Corporation, and William T. Church, secretary.

Midwestern Notes

The officers of the Inner Shoe Tire Co., Grand Rapids, Michigan, are as follows: T. H. Goodspeed, president; B. B. Noble, vice-president and general sales manager; J. W. Goodspeed, treasurer; and M. S. Weaver, secretary. The company manufactures the "Red Innershu" used as a tire inner liner for either new or old tires.

At a recent meeting of the stockholders of the Grand Rapids Tire & Rubber Corporation, Grand Rapids, Michigan, both the directors and officers of the organization were reelected. The report of the treasurer showed the company to be in excellent condition financially, and plans for capacity enlargement were discussed. The capital stock has been increased from $1,000,000 preferred to $3,000,000 preferred and 60,000 shares of common stock, no par value. L. A. Brown is president and general manager, and C. S. Dickey is treasurer.

The Sponge Tire & Rubber Co., Red Wing, Minnesota, is now producing from 450 to 500 casings a day. The recently-completed addition to this company's plant is being equipped for the manufacture of all sizes of special oversize gray tread cord tires. Executives of this company include: N. P. Rogers, president; J. F. Diefenbach, vice-president, and George N. Graham, general manager.

The Rubber Trade on the Pacific Coast

Manufactured Goods

To the coming of more settled weather is attributed a marked improvement of late in the rubber trade all along the Pacific Coast. As might be expected, the industrial betterment was most noticeable in tires. Better climatic conditions accounted largely for this favorable change, but no small factor was the inducement offered dealers by manufacturers under the "spring dating" terms, the general advantage being a three months' credit instead of one month on all orders placed during the past three months. The Goodyear concern kept the offer open for four months, and the California plant reports that the orders received have more than fulfilled the most confident expectations.

Tire dealers are being assured by mid-western and eastern manufacturers that any further reduction in prices is practically impossible, and that it is more than likely that prices will soon be revised upward. Manufacturers of tire repair materials, who have been decidedly hit by the drop in tire prices, try to find some comfort in this assurance. Tire dealers also report that buyers have very gracefully acquiesced in the change wrought during the past three months by the substitution of the standard tire warranty of The Rubber Association of America for the old-time mileage guaranty.

Increased activity in building has stimulated trade in mechanical rubber goods, as has also the extension of many large factories. Manufacturers' representatives report demand for rubber shoes holding up exceptionally well, with an urgent call for sports shoes. In a wide range of druggists' sundries the wholesale dealers report a somewhat better demand. A much improved market for insulated wire and hard rubber electrical goods is foreshadowed in big development plans of several hydroelectric power companies in the Northwest and Southwest.

Los Angeles and Vicinity

The Reilly Rubber Co., capitalized at $50,000, is one of Los Angeles' newest enterprises. This concern, which will specialize in the manufacture of "Mission" inner tubes exclusively, has been organized by J. R. Reilly, recently general sales manager for the California Goodyear company. The factory now being built at 2432-2434 East 56th street, will cost about $40,000 when fully equipped.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, is having a 6-story building erected at the corner of San Pedro and Winston streets, Los Angeles, for its exclusive use. The second floor will be used for the manufacture of panels and switchboards, the western staff will have offices on the sixth floor, and the remainder of the building, which is to be ready August 1, will be used for delivery, storage, demonstration, etc. A radio station on the roof will keep the staff in touch by wireless and telephone with other branches and the parent concern in Pittsburgh.

A large Los Angeles brewery has been bought by the newly-organized Imperial Cotton Mills Co., and will be at once converted into a factory in which tire fabrics and other textiles will be manufactured. The plant will have 20,000 spindles and 600 looms, and production will begin, it is said, by August 1.

W. O. Rutherford, vice-president of The B. F. Goodrich Co., Akron, Ohio, has recently been studying trade conditions on the Pacific Coast during a tour of several weeks.

San Francisco

Lead-free zinc oxide is being made by the Shasta Zinc & Copper Company of California, for rubber manufacturers and the product is handled by Dill-Coppage, Inc., 235 Pine street, San Francisco, California, as selling agent. An eastern sales organization will be formed for marketing the Shasta products, when the larger part of this plant's output will be shipped to the Atlantic seaboard by water from San Francisco. Dill-Coppage, Inc., is the successor to Dill-Crosett, Inc., which has supplied Pacific Coast trade with chemicals and pigments for many years.

Following a recent visit to the Pacific Coast by John H. Phillips, president of the Hydro-United Tire Co., Pottstown, Pennsylvania, a coast branch was established at 410 Beach street, San Francisco. It will be operated by a corporation bearing the same name as the parent concern and capitalized at $25,000. The officers are K. Stone, M. Crane and C. Connick.

The Hollywood Rubber Co., capitalized at $50,000, has been incorporated as a rubber manufacturing concern with its principal office in San Francisco. The incorporators are: E. L. Thompson, J. F. Downey, L. C. Ferguson, S. M. Wilton and T. M. Martine.

Northwestern Notes

The Pacific States Rubber Co. has an authorized capital of $2,500,000, of which $1,500,000 is preferred and $1,000,000 common stock. Plans are being made for the erection of a $500,000 mill at Vancouver, Clarke County, Washington, and, while it is the intention of the company to engage as soon as possible in the manufacture of several kinds of rubber goods, its plant for a while will be utilized for making tires and tubes.

A. Warren Gould, president of the Oregon Volcanic-Tuff Products Co., Portland, Oregon, recently returned after visiting eastern rubber manufacturers to introduce Tuffite and Tuffine, the former a toughening and heat-resisting compound and the latter an accelerator. Both are made from volcanic tufa, a mineral quarried by the company east of Mount Angel, Oregon.

T. R. Conway, of Coffey & Conway, 27 North Park street, Portland, Oregon, has been appointed northwestern district manager by Geo. K. Culp, Inc., of New York, N. Y., tire distributer. Mr. Conway is the head of the Portland Rubber Club and had been an active factor in the tire trade for many years.

Southwestern Notes

Royal B. Lee, advertising manager of The Spreckels "Savage" Tire Co., San Diego, California, has been elected secretary and treasurer as well and a member of the board of directors.

Arizona Cotton

Cotton for various fabrics used in the rubber industry is still selling at comparatively low prices in the Southwest, nor is the price expected to be much higher in the near future. Long staple Pima, which cost the Arizona raisers on an average of 30 cents a pound to produce, has been bringing but 26 to 28 cents. Many either have abandoned cotton raising, or have turned to growing Alcala cotton (1⅛ to 1 3/16-inch staple), which, though it may not bring as good a price as the longer-stapled Pima, is much cheaper to raise. Raisers of short cotton have been more fortunate than those handling the American-Egyptian grades, one large grower in Imperial Valley, California, having sold at 20 cents a pound a crop worth nearly a million dollars that cost but 10 cents a pound to raise. The long-staple cotton men do not expect much relief from the proposed tariff of 7 cents a pound on Egyptian cotton, and they still contend that the 10 cents asked for was fully needed to safeguard the southwestern growers against foreign competition.

A New Rubber Factory in Denver, Colorado

The recently-organized Continental Rubber Products Corporation, First National Bank Building, Denver, Colorado, will soon begin the manufacture of inner tubes, radiator hose, shoe heels, soles, and a general line of mechanical rubber goods. Both A. E. Sidnell, president of the company and Paul D. Steele, vice-president and factory manager, are familiar with the rubber industry, and have been connected with the Gates Rubber Co., also of Denver. These officials, with W. G. Whitfield, as secretary, believe that they occupy a field that is comparatively undeveloped, while in Colorado certain crude materials used in rubber manufacture, are available.

The Rubber Trade in Canada

Canadian-Connecticut Cotton Mills Dedicates New Plant

Officials, representing the leading rubber manufacturing interests of Canada, visited, on February 15, the new plant addition to the Canadian-Connecticut Cotton Mills, Limited, at Sherbrooke, Quebec, Canada. After a luncheon at the St. George's Club the guests made a thorough inspection of both the old and the new mills, which are subsidiaries of the organization known as R. J. Caldwell Co., Inc., 15 Park Row, New York, N. Y.

In The India Rubber World, April 1, 1921, appeared a brief sketch of the business career of R. J. Caldwell, chairman and director not only of the above-mentioned Canadian plant, but also of various other cotton mills, situated mainly in New England.

Well-Known Canadian Rubber Men Visit Sherbrooke Cotton Mills

LEFT TO RIGHT, KNEELING—Theodore Wood, H. W. Shultz, C. H. Carlisle, R. J. Caldwell, S. Casey Wood, J. H. Christie, R. Donald Worth; STANDING—Ezra Dimon, C. N. Candee, R. W. Ashcroft, S. R. Fuller, H. R. Nixon, P. A. Thompson, W. A. Eden, E. B. Ross, A. G. Dickson; MOUNTED—J. B. Maus, F. E. Partridge, A. D. Thornton, T. H. Rieder

Canadian Notes

John B. Maus, who for the last fifteen years has been identified with the rubber industry, was recently appointed director of sales of the Oak Tire & Rubber Co., Limited, 258 Victoria street, Toronto, Canada. Mr. Maus has been connected successively with the following organizations: The Goodyear Tire & Rubber Co., Akron, Ohio; The United States Tire Co.; The Batavia Rubber Co., Batavia, New York, and The Fisk Rubber Co., Chicopee Falls, Massachusetts.

According to a statement recently made by F. Law, president of the Oak company, its plant in Oakville, Ontario, is running at full capacity twenty-two hours a day, with many unfilled orders on hand. A large number of new accounts have been opened since January 1.

STATISTICS OF THE CANADIAN RUBBER INDUSTRY

Some interesting and valuable statistics for the year 1920 have been recently compiled by the Census Bureau in connection with the Canadian rubber industry. As stated in The India Rubber World, December 1, 1921, Canada ranks fourth among the countries of the world in her manufacture of rubber goods, producing in the year 1910 articles valued at approximately $5,000,000. In 1919 the figures had increased to $56,000,000, followed by $80,717,308 in 1920. Canadian tires, manufactured in 1910, were valued at $1,000,000, growing to $31,000,000 in 1919, and $40,760,654 in 1920.

A steady progress is also noted in the manufacture of rubber belting, Canada producing in 1920 an amount valued at $3,101,412. Exports of this commodity during 1919, 1920 and 1921 were valued at $14,332, $24,455 and $83,869 respectively. In 1920 Canada's total production of rubber hose reached the figure of $1,882,518. An increase for 1921 over 1920 is also noted in these exports, the estimates being $195,556, $169,822 and $225,435 for 1919, 1920 and 1921, respectively. Canada exported in 1920 rubber footwear valued at $1,632,679, the total amounts produced being estimated at $24,332,320.

Imports into Canada of crude, hard, scrap and reclaimed rubber during 1920 totaled 32,730,170 pounds, valued at $13,738,205.

THE MOST POPULAR TIRE SIZE

An analysis of the 1922 specifications of 155 passenger automobiles, 70 commercial cars and trucks, and 5 electric vehicles, produced by leading manufacturers shows that the 32 by 4 tire is evidently the most popular size for passenger cars, 44 of these 155 makes using this, while 23 favor the 32 by 4½ type. Sizes of tires for commercial vehicles vary widely, from pneumatics measuring 31 by 4 for both front and rear wheels to solid tires with a measurement of 36 by 6 inches for the front, and 40 by 14 inches for the rear. Of the few electric vehicles the largest size of tire for trucks measures 36 by 5 inches for the front, and 36 by 7 inches for the rear wheels. Pneumatic tires for electric passenger vehicles are given as 32 by 4½ and 33 by 4 inches.

The Rubber Trade in Great Britain

By Our Regular Correspondent

Dunlop Rubber Co., Limited

Americans are accustomed to do things in a large way, but on this side the Dunlop Rubber Co., Limited, report, with its loss of over eight million pounds sterling, has caused more than passing comment. Sympathy is expressed for Mr. Szarvasy, the new chairman, in the troubles he succeeded to, and the first shock once over, the main point being debated by shareholders is the probability of a reduction of capital and the method of its attainment, the subject having been broadly hinted at by the chairman at the meeting. That the Dunlop loss is due to the great fall in the price of raw material, rubber and cotton bought in advance on a large scale and also, to some extent, to financing the American subsidiary, is open to no dispute.

Both Sir Arthur Du Cros and Mr. Ormerod have addressed meetings of shareholders and explained their respective positions with regard to what has taken place. An investigation committee was appointed at the general meeting, consisting of an eminent accountant to be appointed by the board, Sir Josiah Stamp, J. M. Thompson, of Belfast, and F. Sobey, of Yorkshire, who will have full power to inspect all books and documents and to question all directors and servants of the company.

Mr. Szarvasy said that the American company had been saved by the Dunlop Rubber Co., Limited, taking up, with the assistance of its bankers, about half the one-year bond issue guaranteed by it, and arranging with the holders of the remainder to postpone their claim for repayment for a year. The most promising method to deal with the situation, he thought, would be a "combination with existing interests in America." That avenue was being explored. Meanwhile, the arrangement regarding the bond issue has resulted in an addition of £560,000 to the £3,780,000 at which the American assets stand in the balance sheet.

"Back to First Principles"

The editorial under this heading in the February issue of The India Rubber World refers to a matter which home rubber manufacturers cannot afford entirely to ignore. The writer is clearly of their opinion, though he obviously thinks that the sudden recrudescence of interest in unvulcanized rubber goods cannot come to anything really important as compounding and vulcanization have been proved in practice to be essential in the great majority of goods. I think nothing came of Kelway Bamber's proposal about a decade ago to vulcanize rubber goods with chloride of sulphur in the jungle, but in the present state of the plantation industry there is greater incentive to do something of the sort. In the case of Ceylon, although tires have not yet been made, I understand that many estates have taken to the manufacture of motor mats, horn bulbs, etc., which are being turned out rapidly. Retreading is also said to be another line, and rubber motor-cycling boats are now a common thing with the residents of Ceylon. The development is hailed with favor in India, where the prospect of obtaining cheap rubber goods pleases. What we shall want a little later on is a report on the comparative values of the new and the old manufactures.

Institution of Rubber Industry

At the Manchester meeting held February 6, J. L. Rosenbaum read a paper entitled "Rubber Mixes and the Question of Accelerators," the president, J. H. C. Brooking, being in the chair. The author stated that his remarks would be limited to the synthetic organic accelerator and that he would deal only with the component parts of rubber mixings in so far as they influence or modify the action of the accelerators.

The use of these organic accelerators, nearly all of which are nitrogenous bodies, owe their origin, he said, to synthetic rubber, it having been proved that the difficulty in the vulcanization with sulphur is due to the absence of certain nitrogenous constituents which are always present in raw rubber. Although aniline oil was used in America at an earlier date, the first organic accelerator patent was piperidine, claimed by the Bayer Co. in 1912. At the present day the list has swollen to formidable dimensions and the vexed question of trade nomenclature has arisen. Personally he agreed with the American opinion that the exact chemical nature of any accelerator should be disclosed to the buyer, but he also thought that a short descriptive trade mark or other popular designation is of the utmost value in facilitating trade.

It seems obvious that the great strides the American rubber industry has made in recent years has been due to some extent to the use of organic accelerators and there seems no doubt that Britain will have to follow suit. He thought he was justified in saying that they could be used not only for the speeding up of the vulcanization process but also for improving the physical properties of the rubber, preventing sulphuring up, improving aging properties, and in preventing the formation of sulphide of copper in rubber-covered cables. It must be borne in mind that the accelerator manufacturer can give only approximate information as to his product and the rubber manufacturer must investigate and determine the best conditions of use for himself.

The important matter of the toxic properties of accelerators was considered at some length, Mr. Rosenbaum thinking that the harmful effects have been greatly exaggerated, yet recognizing that this is a matter which cannot be lightly dismissed. It is important to distinguish between compounds which produce merely a superficial skin irritation and others which produce deeper-seated general poisoning effects, aniline oil and dimethyl aniline oil coming in the latter category.

R. & J. Dick, Limited

This well-known balata manufacturing firm, whose headquarters are in Glasgow, Scotland, has now issued its accounts for the year ended August 31, 1920, there being a debit balance of £315,773. By bringing in the sum at credit of share premium account, £79,989, and reserve fund, £175,000, the debit balance carried forward is reduced to £60,754.

It appears that the trading of the American subsidiary has also resulted in losses, though not serious. It is with the affairs of Dickbalata, Limited, that the worst aspect of the report is concerned. This subsidiary, in which the parent company holds all the shares, was formed to work certain balata concessions in Venezuela so that the company could obtain its raw material of block balata at first hand. Financial liabilities have been incurred, which, it is understood, cannot be liquidated except by a reduction in the ordinary share capital of R. & J. Dick, Limited. The balata concessions are still to be worked, not by the company directly, but by a local merchant to whom they have been leased.

Leslie Symonds, M. I. M. M., who has twenty years' experience in the district in connection with Goldfields of Venezuela, Limited, has been made a local director of Dickbalata, Limited, and will act as the local representative of R. & J. Dick, Limited.

Change of Title

It is announced that the business founded many years ago by the late Thomas Rowley in East Manchester, and carried on in more recent times at Green Lane, Brook street, Manchester, as Thomas Rowley & Co., Limited, will in future be known as James

Wallwork & Son, Limited. This does not mean any change in proprietorship, as Mr. Wallwork was in the business in Mr. Rowley's time and succeeded to it at his decease. At the same time it means the effacement of a name very familiar to rubber men who are now getting on in life. Mr. Rowley made himself useful to the trade in a variety of ways as a supplier of chemicals, reclaimed rubber, waste rubber, second-hand machinery, etc., and the present business runs on much the same lines.

Henley's Telegraph Works Co., Limited

The report for 1921 shows the actual net profit of £224,700, against £193,000 in the preceding year and the same dividend of 15 per cent is being paid, although the capital has been increased by the issue of 250,000 new ordinary shares. The premium of four shillings each on these shares has been transferred to the reserve fund, which now stands at £220,000. Last year the subsidiary company, Henley's Tyre & Rubber Co., Limited, increased its capital from £200,000 to £250,000, all the new shares being taken up by the parent company.

The Leyland & Birmingham Rubber Co., Limited, has declared an interim dividend of 5 per cent on the ordinary shares, as compared with no dividend a year ago.

Rubber Glass

The cold curing of rubber gels or solutions by the Peachey cold cure process has been modified by Fordyce Jones, of the Reliance Rubber Co., London, and his patent has been made over to the Peachey Process Co. on terms and their interests are now merged. One of the suggestions for the new process is to use sheets of transparent vulcanized rubber as a substitute for glass, and this has been on an experimental scale. I gather, however, that Mr. Jones himself by no means expects the speedy collapse of window glass manufacture and is unable to cheer up the harassed plantation shareholder with the opinion that this particular application of his patent will solve the problem of overproduction.

Rubber Latex Paper

The use of rubber latex in paper making, according to Frederick Kaye's patent, is being talked about a good deal and a very large tonnage of rubber is mentioned for use in this connection in the early future. If the process materializes as is confidently predicted by those interested in it, 50,000 tons of rubber would be absorbed per annum in the world's production of paper. The latex is to give bursting strength and folding resistance to ordinary paper. No additional expense in new machinery or methods is required, experiments having shown that the rubber latex pulp runs on the machine just as easily as a pulp sized with resin, etc., in the usual manner. In many kinds of paper less than one per cent of rubber would be contained, while in other kinds a much larger amount might be found to be desirable. It is suggested that by the use of rubber latex many hitherto little regarded fibers could be used to advantage.

Redferns Rubber Works, Limited

This firm, located at Hyde, near Manchester, which has risen from a small to a large firm in a few years, and has now a total capital of £200,000, shows in its annual report that, like other similar concerns, it has felt the prevailing depression. The full dividend of 7½ per cent is paid on the A cumulative preference shares, but the B preference shares and the ordinary shares get no return. The carry forward is £9,981.

AERO CLUB OF LONDON ENJOYS NEW SPORT

Shooting at toy balloons with shotguns from airplanes is a new form of sport very popular with the London Aero Club. In a recent match balloons, blue in color, were released every two minutes from the corner of the airdrome and ascended in the air at the rate of 300 feet a minute. The game was to bring down as many balloons as possible in a given space of time.

The Rubber Trade in Europe

By Our Regular Correspondent

France

The first rubber sale, which was held on January 27 at the new Paris market, was declared a success. The goods offered comprised 65 tons of first latex pale crêpe, 27 tons of smoked sheets and 5 tons of brown crêpe. The average price obtained for the best crêpe was 4.56 francs a kilo, for sheet, 4.43 francs and for the brown crêpe 4.275 francs a kilo. The nominal value of a franc is $0.193; the kilo is equal to 2.2 pounds.

The Société l'Urbaine, Gentilly, a rubber company capitalized at 700,000 francs, has been declared bankrupt.

Russia

According to the *Neue Freie Presse* of Vienna, the Russian rubber concerns Treügolnick, Bogatyr, Prowodnik, and other manufacturers have combined in a trust.

The *Bulletin de l'Association des Planteurs de Caoutchouc* states that the Bergougnan firm is negotiating with the Soviet Republic over a deal amounting to 793,000 francs, payable 25 per cent cash and the rest against irrevocable credit. The transaction was made through the Arcos Old Rochian Cooperative Limited, a private Anglo-Russian concern with offices in London. The Bergougnan Company has stipulated that the goods will not be taken away until after payment. Two representatives for the buyers, one Russian and the other English, have arrived at Clermont-Ferrand to look after this delivery.

Germany

According to Article 268a of the Peace Treaty of Versailles, Germany is obliged for the period of five years to allow certain goods, raw and manufactured, products of Alsace-Lorraine, to enter Germany duty-free. The quantities are not supposed to exceed the average yearly quantities of 1911 to 1913. Included are goods that have been partly manufactured in some other country, but which will be finished in Alsace-Lorraine. Rubber is one of the items on this free list and the quantities to be admitted duty-free from January 11, 1922, to January 10, 1923, are as follows:

	1922 Metric Tons	1921 Metric Tons
Rubber goods	40	353
Rubber waste	210	
Transmission belting	36	
Asbestos goods (and bricks, etc.)	20,000	30,000
Surgical apparatus and bandages	400	705

Commenting on this list, the *Gummi-Zeitung* says that Alsace-Lorraine never delivered such amounts of goods to Germany in a year. Of course, it is difficult to prove this with figures, as naturally no separate statistics for Alsace-Lorraine were kept when these provinces made up a part of Germany.

The End of the Boom

The reaction after the boom which was predicted a little while ago seems to have materialized. Complaints are being heard in different branches of the rubber industry about the canceling of orders, both for the local and foreign markets. After the feverish buying and ordering that prevailed a few months ago, there is a good deal of inactivity. The *Frankfurter Zeitung* reports that the Wuppertal rubber and elastic band and allied industries complain that there are so few orders that the looms cannot be kept working to capacity. It is said that, owing to the high prices, consumers are holding back as they do not care to bind themselves for any length of time at present.

German Notes

The Mitteldeutsche Gummiwarenfabrik Louis Peter, Aktiengesellschaft, Frankfort-on-the-Main, declared a dividend of 35 per cent. Business is reported to be much better than last year and

unless something unforeseen intervenes, the firm may count on an active business for the current year.

The Lindener Gummiwarenfabrik G. m. b. H., Hanover, is in liquidation.

The rubber factory of Carl Senf, Leipzig-Silesia, has been bought by Theodor Gallus and the business will be continued under the name Gummiwarenfabrik Carl Senf, Inhaber Theodor Gallus, Leipzig-Silesia.

At a recent meeting the Rauhgummi-Aktiengesellschaft, Berlin, declared that, owing to the great demand for its product throughout Germany, this territory would be divided into nine districts and manufacturing and selling rights would be given to each district.

The firm Gummiwerke Grasleben, Grasleben (Bez. Magdeburg) will in future be known as the Allerthal-Werke, Aktiengesellschaft Grasleben.

Koewa-Gesellschaft m. b. H., Ilmenau; manufacture, sale and export of thermometers, glass instruments, hard rubber goods and allied articles.

Gummiabsatz-Gesellschaft m. b. H., Berlin; manufacture and sale of rubber heels, also business with branches directly or indirectly connected herewith.

India Gummiwaren-Gesellschaft m. b. H., Hamburg; this firm will sell the "India-Norab" brand of goods manufactured by the Gummiwerk India G. m. b. H., Hanover.

Pneu-Vertriebsgesellschaft m. b. H., Dresden; manufacture and sale of tires, accessories, and eventually novelties.

New Firms

Injecta Aktiengesellschaft, Berlin; manufacture and sale of surgical instruments and the like. Capital, 1,000,000 marks.

Gummihandfabriken Aktiengesellschaft, Elberfeld. Manufacture and sale of elastic webbing and articles made thereof. The capital is 4,000,000 marks.

Hannoversche Balatawerke G. m. b. H., Hanover. This firm will continue the business of the Balatawerke Ferdinand Stein, Hanover-Wülfel. The capital is 500,000 marks.

Foreign Tariffs

Austria

No application for a special permit is at present necessary in importing certain goods into Austria, according to recent rulings. In the list of articles mentioned as being comparatively free from restrictions are the following:

Austrian Tariff No.	Articles
310	Toys of soft rubber.
ex 315-317	Clothing and other made up articles of tissues, covered, etc., with rubber, or of elastic tissues.
318-319	Rubber wares combined with very fine materials or mounted with precious metals.

Hungary

According to a decree of November 25, 1921, the list of commodities which may be imported into Hungary without license has been increased. Among the items mentioned are included hard rubber and mechanical goods of this material.

Mexico

The export duty on rubber and guayule gum has been removed, as a result of a presidential decree, effective January 6, 1922.

New Zealand

A special depreciated currency surtax is to be applied to certain goods imported into New Zealand. Rubber tires are among the articles mentioned as being subject to this new ruling.

Portugal

Portuguese import duties, payable wholly in gold, are no longer required for certain goods, among them being solid rubber tires with iron bands, for lorries.

France and Poland Form Commercial Agreement

A commercial agreement, signed February 6, 1922, by France and Poland, grants to the former country most favorable treatment. Tariff reductions in some cases amounting to 50 per cent, have been gained, while no tax will be levied on French "transit" merchandise warehoused in Poland. Certain luxury goods, such as automobile cloths and tires, etc., ordinarily prohibited from importation into Poland, will be licensed for importation from France up to a fixed quota.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

Available statistics show that the amount of rubber exported during 1921 was about 177,880 tons, valued at approximately 117,853,000 Straits dollars. This compares with 208,880 tons, value $369,998,000 for 1920. This shows that even in Malaya where curtailment was taken up more widely than elsewhere, voluntary restriction did not make a very marked difference in exports. In fact, as W. Duncan says, the restriction was only about 10 per cent instead of 25 and 50 per cent as it was planned.

The highest price for rubber on the Singapore market in 1921 was 39½ cents in December. In 1920 the highest price, which was quoted in February, was 114½ cents. The lowest quotations were in June when 24 cents was the best price to be obtained. The effect of this slump on general business conditions soon made itself felt and trade all over the country suffered.

Directors ordered immediate and drastic economies; many European employes were discharged; and coolies were sacked wholesale. Now the country faces a shortage of coolie labor, which is a serious problem for Malaya which has no adequate local labor supply and depends upon Chinese and Tamil labor.

However, as things are developing, it seems that this is a benefit to the rubber industry. For, no sooner did prices exceed 30 cents a pound than some London directors issued orders to increase the labor force and work to full capacity. If it were possible to carry out these orders it can readily be seen that the slight improvement in the market would soon disappear again. There are not enough coolies available to increase production, and consequently the result will be crimping and advancing wages. This cannot go very far as the extra labor cost would soon wipe out the meager profit that might be obtained.

To guard against interstate competition for labor, planters wish to come to an agreement and fix a standard wage. But unless such a movement is backed by directors, any decisions arrived at by the planters are useless, and it is feared that this backing will not be forthcoming. The lack of cooperation between managers, agents, and directors has long been a disadvantage to the industry here. The managers are not allowed a sufficient voice in important matters, although they are in a better position to judge impartially and disinterestedly of what is really best for the estates.

Company Notes

At the annual meeting of the Devons Estates (Malacca), Limited, held in Singapore, the chairman spoke of the wrong impression in the minds of American rubber consumers regarding the profits made. For example, it is held that if the all-in cost of rubber is 25 to 30 cents a pound (a very low figure for Malaya), and the price received for the first-grade sheet or fine pale crêpe is about 40 cents, this leaves a handsome profit. However, the figures are misleading. Assuming that costs were 30 cents and the price obtained 40 cents, it must still be remembered that only 75 per cent of the average yield per acre—about 350 pounds for most estates—is of the best quality. It is doubtful if any such estates make a profit of $30 per acre. Even so, except for the

oldest estates, the valuation per acre must be put at $850 and it will easily be seen that $30 profit a year on a capital valuation of about $850 must mean no dividends for shareholders, no fresh capital for planting and no proper care of estates.

New Uses for Rubber

The *Straits Times* reports that J. M. Hoover has made a suggestion which may prove useful to libraries in the tropics. He exhibited a small book with a rubber cover, that is damp proof, not attacked by insects, yet is pliable and tough. It has all the good points of leather, besides many others, and a very handsome book can be made.

Ceylon

The year 1921 has been the most disastrous one in the history of the rubber industry. Owing to certain circumstances in its favor, a low cost of production and a low rate of exchange of the rupee against sterling, Ceylon was not so hard hit as Malaya, Sumatra, or Brazil. But even so, the conditions in the industry are such as to cause deep concern for the future.

Exports of crude rubber in 1921 amounted to 90,071,102 pounds as compared with 87,296,356 pounds during 1920 and 100,392,831 in 1919. Of the 1921 amount, 53,125,393 pounds or 59 per cent of the total exports went to the United States, which is considered satisfactory in view of the fact that in 1920 the exports to the United States were only 38,233,874 pounds or less than 44 per cent. However, it is of course below the 1919 figures, when 65,473,466 pounds of rubber or over 65 per cent was shipped direct to America.

The lower freight rates to the United States were partly responsible for the 1921 increase in direct exports. Other countries which took more from Ceylon in 1921 than in 1920 were: Germany, 4,445,279 against 1,062,362 pounds; Canada and Newfoundland, 755,148 against 580,304 pounds; Holland, 374,281 instead of 165,794 pounds; Belgium, 265,584 instead of 259,150 pounds; Denmark, 51,610 pounds against nil; India, 9,490 instead of 2,176 pounds; Austria, 980 against nil.

The countries which took less were: United Kingdom, 29,707,720 in 1921 and 44,717,774 pounds in 1920; France, 515,020 against 777,113 pounds; Japan, 326,129 pounds against 326,345 pounds; New South Wales, 193,400 pounds against 499,417 pounds; Victoria, 129,630 pounds against 391,991 pounds; Italy, 169,120 pounds instead of 230,720; Straits, 14 pounds instead of 44,800 pounds; Norway, 2,240 pounds instead of 4,480 pounds.

The lowest prices during the year were in June when ribbed smoked sheet sold for 39 rupee-cents (the normal value of a rupee is about 32 cents United States currency). After that prices rose until 68 cents was quoted in December for contract crêpe. A notable feature was the increasing demand for the lower grades of scrap and crêpe and the rise in the price of smoked sheet to a parity with first quality crêpe.

Ceylon is at last getting interested in vegetative reproduction of the better-yielding types of Hevea and the Agricultural Department has sent one of the Peradeniya staff to Java to study the methods in use there.

Netherlands East Indies

G. F. Bodde, of Weltevreden, Java, in an article recently published in the *Nederlandsch-Indisch Rubbertijdschrift*, points out that no estimates of future production take into account the fact that rubber trees yield increasing quantities of latex up to a certain age, generally 12 years, after which the yield gradually declines. Therefore in calculating productions it should be remembered that the increasing crops from the younger trees are balanced by the backward movement in the older plantations, the average maximum yield being 400 pounds per acre.

According to the writer's estimates, by 1926 the future total world's crops under normal conditions and without restrictions would be 413,500 tons, which includes 20,000 tons of wild rubber. Calculating that the consumption for 1921 was 300,000 tons and that thereafter it would increase annually by 25,000 tons, the total for 1926 comes to 425,000 tons, which shows a shortage of 11,500 tons in that year of production as against consumption.

This being the case, the actual condition is summed up as follows: The present planted acreage is not too great for the more distant future need of rubber, but expansion took place so rapidly that the regular increase in consumption could not keep up with production whereby a surplus has accumulated which it will take five years to absorb. Temporary restriction is not a measure to prop up weak producers but rather a means of regulating the temporarily disturbed balance between demand and supply, to the benefit of producers now and of consumers later on. If the agreement to restrict by 25 per cent, to which many producers have adhered, could be carried out for two years or more, by the end of 1923 there would be a shortage of 11,625 tons of crude rubber.

Mr. Bodde's statements have been freely criticized, the three main objections being:

1. The figures for production are placed too low.

2. No account has been taken of the fact that technical research in the plantation of rubber is progressing and that much is being done to increase yields.

3. The world consumption of rubber for the next few years has been placed too high.

Answering these objections, Mr. Bodde states that his calculations are based on accepted figures. As for technical improvements, soil cultivation, manuring, thinning, and fighting of diseases, etc., these are precautions against estate deterioration, and subsequent decreased yields. As for selections, any benefits derived therefrom relate only to future plantations and not to those already in existence. As for greatly increased yields by vegetative reproduction, Mr. Bodde believes that an average of 500 pounds per acre of budded trees tapped over one quarter on alternate days is more than satisfactory.

Regarding consumption figures, these are justified by statistics which show that while the use of rubber is expanding in America, it is increasing at a proportionate rate in other countries.

Budded Trees

Dr. W. Vischer describes in the *Archief voor de Rubbercultuur*, January, 1922, results of comparison of the development of 3¼-year-old budded trees with that of 4-year-old seedlings from selected seed of high-grade mother trees.

In August, 1921, the number of latex vessel rows varied from 5 to 17 and the average was 12, which is very high for trees so young. In the 4-year-old seedlings the rows ranged from 2 to 16, the average being 6. The average girth of seedlings and budded trees was about the same, namely, 40 cm., but while in the case of the latter the circumference varied from 21 to 47 cm., the differences among seedlings were far greater, some trees having a girth of 60 cm. while others measured only 15 cm. It was further found that among budded trees, those that appeared to be equally well-developed externally also showed similar anatomical characteristics, while in the case of seedlings some well-developed trees showed far finer latex vessel rows than trees of considerably smaller girth, and vice versa, too.

The conclusion follows that vegetative offspring belong to a single type and the peculiarities of the mother tree reappear in spite of the stock and foreign roots on which the bud has been grafted, while seedlings from a single mother tree did not reproduce the superior internal qualities of that mother tree. The budded trees have developed very favorably and show a much larger number of latex vessels than seedlings of the same age.

Netherlands East Indies Notes

During the nine months ended September, 1921, East Coast of Sumatra exported 16,822 tons of rubber against 16,148 tons during the corresponding period of 1920.

Recent Patents Relating to Rubber

The United States

Granted February 7, 1922

NO. 1,405,436 Tire gage. I. Pulverman, Warren, Pa.
1,405,481 Demountable split rim for tires. W. N. Booth, assignor to Kelsey Wheel Co., Inc.—both of Detroit, Mich.
1,405,503 Container and display carton for hot-water bottles. W. M. and C. J. Doering, Cincinnati, O.
1,405,504 Container and display carton for tires. W. M. and C. J. Doering, Cincinnati, O.
1,405,505 Container and display carton for tires. W. M. and C. J. Doering, Cincinnati, O.
1,405,563 Clincher rim for pneumatic tires. N. L. Baker, Philadelphia, Pa., assignor to N. L. Baker Manufacturing Co., a Delaware corporation.
1,405,859 Resilient tire having two pneumatic tubes. M. J. O'Connor, Bloomingdale, N. J.
1,405,960 Resilient tire. L. W. Wood, Fontanelle, Iowa.
1,405,962 Combination garment with elastic band across back of waist. J. M. Atkinson, assignor to Oppenheim, Oberndorf & Co., Inc.—both of Baltimore, Md.
1,405,963 Union garment with elastic band across back of waist. J. M. Atkinson, assignor to Oppenheim, Oberndorf & Co., Inc.—both of Baltimore, Md.
1,405,970 Fountain-pen pencil. J. H. Crowell, Tisbury, Mass.
1,405,972 Oversize plural truck tire. C. J. Dalton, New York, N. Y.
1,405,973 Oversize truck tire. C. J. Dalton, New York, N. Y.
1,406,086 Inner-tube cover. E. J. Rudolph, Wakefield, Kans.
1,406,151 Sectional tire. M. Charles, Mexico, Mex.

Reissues

15,282 Tire lock. H. G. Levy, San Francisco, Calif., assignor to R. H. Butters, Atlanta, Ga. Original No. 1,370,977, dated March 8, 1921.

Granted February 14, 1922

1,406,230 Pressure gage. M. C. Schweinert, New York, N. Y., and H. P. Kraft, Ridgewood, N. J.
1,406,242 Hose clamp. E. V. Szyperski, Toledo, O.
1,406,296 Tire holder. A. L. Stewart and R. W. Powell, Quincy, Ill.; said Powell assignor to said Stewart.
1,406,324 Pneumatic element for vehicle wheels. S. Amoroso, Boston, assignor of ½ to A. Frisch, Winthrop—both in Mass.
1,406,336 Quick-locking cap for tire valves. J. A. Bozung, Denver, Colo.
1,406,341 Windshield wiper. J. W. Cain, Chicago, Ill.
1,406,425 Ear stopper. B. A. Stair, Los Angeles, Calif.
1,406,443 Hose clamp. C. S. and C. A. Cook, Sand Lake, Mich.
1,406,478 Rubber-covered tank for containing inflammable liquids. S. C. Mote, assignor of ½ to A. P. Crouch—both of London, Eng.
1,406,521 Parachute. A. Ackermann, Reiden, Switzerland.
1,406,555 Pneumatic tire having both casing and inner tube composed of layers of leather and rubber united together. S. O. Hahn, Pueblo, Colo.
1,406,630 Cushion tire. M. B. Flaherty, assignor of ½ to J. L. Sober—both of Steubenville, O.
1,406,664 Demountable rim for tires. A. H. Lundstrom, Rockford, Ill.
1,406,710 Coated fabric and method of manufacture. J. A. Wilson, Elizabeth, assignor to The Duratex Co., Newark—both in New Jersey.

Granted February 21, 1922

1,407,012 Reenforced fabric for vehicle tires. T. Branson, Philadelphia, Pa., assignor to Sibson & Stern, Inc., a Pennsylvaniya corporation.
1,407,070 Combined pneumatic and solid tire. F. W. Kremer, Rutherford, N. J.
1,407,082 Hose supporter. I. N. Pollingher, Brockton, Mass.
1,407,200 Hose supporter. W. J. Kelly, Youngstown, O.
1,407,305 Tire boot. E. M. Steell, assignor to Porcupine Manufacturing Co.—both of Spokane, Wash.
1,407,379 Horseshoe pad. H. S. Caryl, assignor of ½ to L. B. Landau—both of Scranton, Pa.
1,407,401 Pneumatic-tire casing. J. I. Freeman and L. J. Peterson, Modesto, Calif.
1,407,410 Toy boat driven by elastic-band motors. M. Hanna, New York, N. Y.
1,407,414 Airplane pilot compartment composed of reinforced walls of elastic rubber plate with air chambers and bulkheads. Ihachi Hatano, 85 Shinobe-mura, Kimitsu-Gun, Chiba-Ken, Japan.
1,407,467 Split rim for tires. W. C. Keys, assignor to The Standard Parts Co.—both of Cleveland, O.
1,407,506 Spring heel. G. J. Winter, Buffalo, N. Y.
1,407,605 Windshield clearer. B. Verlangieri, New York, N. Y.
1,407,625 Bathing cap. A. Baldwin, Pittsburgh, Pa.

Granted February 28, 1922

1,407,730 Inner-tube cushion. J. W. and G. F. Burgess, Kansas City, Mo.
1,407,756 Tire with hollow rubber balls within inner tube. T. H. Kip, New York, N. Y.
1,407,787 Locking rims for demountable tire-rims. L. L. Darrow and F. W. Hoessel, Stockton, Calif.
1,407,967 Serrated solid tire. R. H. Waters, Cumberland, Md., assignor to Kelly-Springfield Tire Co., New York, N. Y.
1,408,012 Tire valve and gage. W. C. Loy, assignor of ½ to F. E. Bryant—both of Rochester, Ind.
1,408,062 Airplane parachute safety device. S. Arrington, New York, N. Y.
1,408,164 Tire rim. J. A. Beddingfield, Fort Valley, Ga.
1,408,165 Tire rim. J. A. Beddingfield, Fort Valley, Ga.
1,408,172 Demountable rim for tires. A. C. Dam, New York, N. Y.
1,408,281 Strap fastening for apparel belts. J. M. Failey, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,408,399 Hard and soft rubber tire and wheel rim. F. Reddaway and G. J. Rackham, London, Eng.

The United Kingdom

Published February 1, 1922

172,430 Sponge-rubber tire interliner. J. A. Andrews, 4 Marldon avenue, Great Crosby, Liverpool.
172,493 Rubber-covered bar or roller for transversely stretching fabric. A. Livesey, 3 Brierley street, London Road, Manchester.
172,499 Sock-suspenders. S. Belman & Co., 73 Pershore street, Birmingham.
172,511 Rubber-padded shoe for animals. S. Bryan, The Smithy, Hatton, Warwickshire.
172,533 Hand-operated tire-inflator. L. Camillis, 91 Soho Hill, Birmingham.
172,534 Two-port rims for tires. E. Acha, 81 Egozcue street, Santuree, Porto Rico, West Indies.
172,576 Bathing costume with air pockets and elastic belt. P. Toborek, 11 rue Ruelle-des-Prés, and F. Zambrini, 4 rue Bardon—both in Nice, France.
172,670 Parachutes. S. J. and B. J. Democratis, 42 Gresley Road, Highgate, London; J. Democratis, 31 Tewfick street, Cairo.
172,781 Golf ball. J. Cuthbertson, 66 Fenchurch street, London.
172,784 Pneumatic tires having two or more bead cores in each edge. Dunlop Rubber Co., Limited, 1 Albany street, Regent's Park, London, and C. Macbeth, Fort Dunlop, Erdington, Birmingham.
172,806 Resilient tire. E. W. Wynne, 35 South John street, Liverpool.

Published February 8, 1922

172,863 Mud guards rotating with wheels, consisting of an annulus of rubber-coated fabric provided with series of rubber stiffeners on inner face. G. Richardson, 53 South street, Greenock.
172,875 Handle for lifting heated articles; gripping surfaces faced with rubber pads. H. Ayliffe, 90 Woodside Green, South Norwood, London.
172,896 Braces made from highly stretchable rubber. M. Coleman, 20D Block, Peabody Buildings, Wild street, Kingsway, London.
173,034 Inflatable bladder for stopping pipes and tubes. S. R. Ogden, Parrs Bank Chambers, Blackburn.
173,061 Rubber soles and heels secured by leather strips. J. H. Fish, Highfield, Bank Road, Crumpsall, Manchester.
173,123 Atomizer. A. Levy, nee Salomon, 54 Quai de Boulogne, Boulogne-sur-Seine, France.
173,137 Compression inner tube. A. B. Shaw, 22 Bowers street, Medford, Mass., U. S. A.

Published February 15, 1922

173,241 Sole and heel protectors. J. Smith, Belle Vue Bungalow, Poulton Road, Fleetwood, Lancashire.
173,249 Check valve for respiratory apparatus. C. Rosling and R. H. Davis, 187 Westminster Bridge Road, London.
173,310 Rubber-jacketed chamber for regenerative respiratory apparatus. R. H. Davis, 187 Westminster Bridge Road, London.
173,372 Resilient tire with cork and rubber core. F. E. Nelson, 724 West 59th street, Chicago, Ill., U. S. A.
173,377 Cushion tire. A. E. White, 88 Chancery Lane, London; S. Johnstone & Co., Inc., 43 Builders Exchange, Buffalo, New York, U. S. A.

Published February 22, 1922

173,550 Tire filler composed of series of interfitting air-chambers. F. J. Tinker, 34 Iron Mill Lane, Crayford, Kent.
173,590 Double vehicle wheels for pneumatic tires. E. C. R. Marks, 57 Lincoln's Inn Fields, London; Società Brevetti Feriani, 3 via due Macelli, Rome.
173,604 Tire-pump attached to wheel and actuated by it. R. Darnfather, 2 Aspenlea Road, Fulham, London.

The Dominion of Canada

Granted February 7, 1922

215,569 Machine for postmarking mail, having a number of rubber rollers, etc. W. H. Bowes, Greenwich, Conn., U. S. A.
215,630 Collapsible split rim for tires. J. H. M. Michon, Toledo, Ohio, U. S. A.
215,711 Pneumatic tire valve. The Newsom Valve Co., assignee of J. N. Newsom, H. E. Harder, and W. F. Leschen—all of St. Louis, Mo., U. S. A.
215,713 Mail-marking machine having rubber rollers and belt. The Pitney-Bowes Postage Meter Co., assignee of J. W. Ogden—both of Stamford, Conn., U. S. A.
215,714 Mail-marking machine having rubber rollers and belt. The Pitney-Bowes Postage Meter Co., Stamford, assignee of W. N. Bowes, Greenwich—both in Conn., U. S. A.

Granted February 14, 1922

215,780 Demountable rim for tires. H. S. Everett, Toronto, Ont.
215,781 Elastic-band pocket-protector for pencils. A. R. Felstrup, San Francisco, Calif., U. S. A.
215,788 Tire alarm. W. A. Harris, Greenville, South Carolina, U. S. A.
215,820 Tire valve and gage. I. Pulverman, Warren, Pa., U. S. A.
215,827 Collapsible rim for tires. H. Schaechterie, Friend, Neb., U. S. A.
215,892 Ship-salvaging apparatus, comprising a collapsible airproof bag. H. D. Deam, Benton Harbor, Mich., and F. J. Petrovics, Chicago, Ill.—both in the U. S. A.

Chemical Patents will be found on page 493. Machinery Patents on pages 497, 498.

Granted February 21, 1922

215,921 Tire interliner. A. E. Brown, El Paso, Tex., U. S. A.
215,926 Tire repair shoe. P. T. Coffield, Tucson, Ariz., U. S. A.
215,927 Air pump. W. D. Coil, Madisonville, Ky., U. S. A.
215,946 Sectional emergency auto tire. C. G. Gerlach, Spokane, Wash., U. S. A.
215,963 Convertible wheel with pneumatic tire. E. L. Keesing, San Jose, Calif., U. S. A.
215,975 Blowout boot for pneumatic tires. H. V. Morris, Brantford, Ont.
215,993 Pneumatic tire sufficiently expansible to be retained in rim by pneumatic pressure. H. S. Rector, Chicago, Ill.
216,054 Douche nozzle. The Dilator Syringe Corporation, assignee of J. Rose—both of New York City, U. S. A.
216,669 Resilient tire with two-part core. The Standard Rubber Works Proprietary, Limited, assignee of A. J. Ostberg and A. Kenny, all of Richmond, near Melbourne, Victoria, Australia.
216,087 Cushion tire. T. Comeau and F. Moffette, assignee of ½ interest —both of Lawrence, Mass., U. S. A.

New Zealand

Published December 31, 1921; Issued January 31, 1922

43,796 Storage-battery separator. T. A. Willard, 8117 Carnegie avenue, Cleveland, Ohio, U. S. A.
45,645 Resilient tire core with two endless spiral or zigzag air passages extending around the interior. G. A. H. Robbins, "Delamore," Kedron, near Brisbane, and S. F. E. Einsiedel, 82 Arthur street, New Farm, Brisbane, Queensland.

Germany

Patents Issued, with Dates of Issue

349,643 (June 19, 1921) Tread patch of rubber. Alfred Richard, Elberfelderstrasse 102, and Gustav Hill, Viktoriastrasse 5, Hagen, Westphalia.
349,857 (May 25, 1921) Pessary. Julius Frankenstein, Kaiser-Wilhelmplatz 5, Berlin-Schöneberg.
349,883 (November 28, 1920) Tire of leather or rubber plates. Konrad Harzheim, Sr. and Jr., Sydonienstrasse 26, Dresden.
350,101 (July 24, 1918) Filler jelly for pneumatic tires. Continental-Caoutchouc-und Gutta-Percha-Compagnie, Hanover.
350,539 (August 17, 1920) Stuffing and packing material. Fridolf Rieter, Winterthur, Switzerland; represented by G. Lotterhos, Frankfort-on-the Main.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted January 24, 1922, Act of February 20, 1905

*151,142 ARIEL—golf balls, etc. J. Grondahl, New York, N. Y.

*Omitted from THE INDIA RUBBER WORLD, March 1, 1922.

Granted February 7, 1922, Act of February 20, 1905

151,474 FEDERAL—mallets made wholly or partly of rubber. The Federal Rubber Co., Cudahy, Wis.
151,475 FEDERAL—mallets made wholly or partly of rubber. The Federal Rubber Co., Cudahy, Wis.
151,476 FEDERAL—mallets made wholly or partly of rubber. The Federal Rubber Co., Cudahy, Wis.
151,511 TIRETEX-RUBBERTEX—liquid preservative coating for tires. L. Ingraham, Philadelphia, Pa.

Granted February 14, 1922. Act of February 20, 1905

151,666 ASHLAND TIRES STURDY AS THE ASH—BEST IN THE LAND, together with representation of an ash tree in front of a rainbow formed by a tire—tires, tubes, and repair parts for same. The Ashland Tire & Rubber Co., Ashland, O.
151,674 AQUA-SHED—waterproof fabrics. Fred S. Bennett, Inc., New York, N. Y.
151,678 BLACK HAWK "CHIEF" and small ornament bearing representation of an Indian running—tires and tubes. Black Hawk Tire & Rubber Co., Des Moines, Ia.
151,722 INTERWOVEN CORD TRADE MARK and representation of a piece of cord fabric—cord fabric rubber patches for tires and tubes.
151,732 THOROBRED—tires and tubes. The Dayton Rubber Manufacturing Co., Dayton, O.
151,773 COMMONWEALTH—tire casings. Gillette Rubber Co., Eau Claire, Wis.
151,779 HEAVY TOURIST GOODYEAR, together with a winged foot between the syllables of the word Goodyear, and a red seal bearing a winged foot and the words GOODYEAR HEAVY TOURIST tires and tubes. The Goodyear Tire & Rubber Co., Akron, O.
151,809 HOOPERWOOD—belting, hose, packing, asbestos brake lining. Wm. E. Hooper & Sons Co., Baltimore, Md.
151,862 VICTORY—composition soling in sheet form. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.
151,877 Two black disks each bearing the letter A in white—chewing gum. Mint Gum Co., Inc., New York, N. Y.
151,954 SORBO—playing balls, toys, leg guards, and wicket and goal keepers' gloves, all made of sponge rubber. Sorbo Rubber-Sponge Products Limited, Woking, Eng.
151,956 "IT'S A BENJAMIN JOHNSTAM SHOO" above seal bearing representation of a shoe against a background formed by a helmet bearing the word FIREMEN, a shield bearing the word POLICE, and a pouch bearing the words MAIL CARRIER, all surrounded by a border bearing the words, "THE ONE FOR ALL WEARERS" and "WHILE YOU SERVE THE PUBLIC WE SERVE YOU GOOD SHOES"—shoes of leather, rubber, fabric, compositions, and combinations of them. B. I. J. Stam, Stoughton, Mass.
151,962 STAR FABRICORD—tire casings. The Star Rubber Co., Akron, O.
151,981 TOYCO within a diamond—toy balloons, balls, animals, dolls, and novelties. The Toycraft Rubber Co., Ashland, O.
151,987 TRAXION, with the letter X larger than the others and having the limbs extended horizontally in both directions above and below the rest of the word to form a border—tires. United States Tire Co., New York, N. Y.
152,024 A grotesque figure representing a golf player, having an adaptation of a golf ball decorated for a head—golf balls. The Dunlop Rubber Co., Limited, Aston Cross, Birmingham, Eng.

Act of March 19, 1920, Section 1 (b)

152,050 PARATOP in white letters within a diamond—rubberized auto top fabric. The Bridgeport Coach Lace Co., Bridgeport, Conn.
152,064 FILLACUT—tire repair material, tire dough, etc. The Fisk Rubber Co., Chicopee Falls, Mass.
152,068 THE GENERAL TIRE & RUBBER CO.—belting, hose, packing, and tires. The General Tire & Rubber Co., Akron, O.
152,083 WESTINGHOUSE—measuring devices, hardness-testing machines, viscosimiters, etc. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.
152,098 SERVE WELL—boots, shoes, and slippers of leather, rubber, or textile materials, or soles therefor. Nathaniel Fisher & Co., New York, N. Y.
152,107 Representation of a cone-shaped coil of brake lining—brake lining and clutch facing. The Raybestos Co., Bridgeport, Conn.

Renewals

20,916 PARANITE—insulated wires, electric cables, and insulating material. Registered March 29, 1892. The Indiana Rubber & Insulated Wire Co., Jonesboro, Ind. Renewed March 29, 1922.

Granted February 21, 1922, Act of February 20, 1905

152,228 TRANSECURA—nipples, soothers, and teething rings. S. Maw, Son & Sons, Limited, London, Eng.

Act of March 19, 1920, Section 1 (b)

152,316 LISTERATED—chewing gum. Listerated Gum Corporation, New York, N. Y.

Renewals

20,448 MASTIFF—rubber belting, hose, and packing. Registered March 15, 1892. Revere Rubber Co., Boston, Mass., assignee to Revere Rubber Co., a Rhode Island corporation. Renewed March 15, 1922.

Granted February 28, 1922, Act of February 20, 1905

152,368 "ALEX"—tire valves. Alexis Charpilloz, Chatelaine, Switzerland.
152,420 DURBAR and outline representation of elephant's head—lather brushes with bristles set in rubber. The Hardright Co., Belleville, N. J.
152,445 JUNIOR—baby pants, waders, and garment protectors. I. B. Kleinert Rubber Co., New York, N. Y.
152,446 JIFFY JUNIOR—baby pants, waders, and garment protectors. I. B. Kleinert Rubber Co., New York, N. Y.
152,516 RUBBERSTONE—composition flooring containing rubber, in blocks and sheets. Junius H. Stone Corporation, New York, N. Y.
152,530 BEACON—golf balls. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.
152,538 WANAMAKER DIANA—golf balls. John Wanamaker, New York, N. Y.

Act of March 19, 1920, Section 1 (b)

152,610 THE WIRELESS—ice bags. The Lobl Manufacturing Co., Middleboro, Mass.
152,915 MILLER—sanitary rubber goods, druggists' sundries, etc. The Miller Rubber Co., Akron, O.
152,630 5 MINUTE—repair vulcanizers. C. A. Shaler Co., Waupun, Wis.

Renewals

18,552 SIMPLEX—insulated wire. Registered October 28, 1890. Simplex Electrical Co., Boston, Mass. Renewed October 28, 1920.
20,339 "O. K."—insulated wire. Registered November 10, 1891. Phillips Insulated Wire Co., Pawtucket, R. I.; Phillips Wire Co., assignee. Renewed November 10, 1921.

The United Kingdom

Published February 1, 1922

420,437 TELAMITE—asbestos brake linings. George Angus & Co., Limited, St. John's Works, Grainger Street West, Newcastle-on-Tyne, and the Bentham Woven Hose & Belting Works, Bentham, Lancaster.
420,540 KRICO—lever self-filling fountain and stylo pens. A. Kirk & Co., 52 South Castle street, Liverpool.
420,631 KIRLEX—fountain pens. A. Kirk & Co., 52 South Castle street, Liverpool
420,633 Conventionalized representation of an airplane—all goods included in Class No. 40. The Beldam Tyre Co. (1920) Limited, Windmill Road, Brentford, Middlesex.
420,634 Conventionalized representation of an airplane—playing balls. The Beldam Tyre Co. (1920) Limited, Windmill Road, Brentford, Middlesex.

Published February 8, 1922

414,858 OCLEV—tires and tire patches. G. L. Pauer, 17 Theresiengasse, Vienna xviii, Austria. Address for service in the United Kingdom, care of Marks & Clerk, 57-58 Lincoln's Inn Fields, London, W. C. 2.

420,915 REALASTIC—waterproof and rainproof clothing. The Monarch Waterproof Co., Limited, Victoria Works, Pimblett street, Cheetham, Manchester, Lancashire.

Published February 15, 1922

B413,823 INGRAM'S LONDON—druggists' and surgeons' rubber sundries. J. G. Ingram & Son, Limited, The London India Rubber Works, Felstead street, Hackney Wick, London, E. 9.

B417,065 SILVERTOWN—electric cables and conductors included in Class No. 8. India Rubber, Gutta Percha & Telegraph Works Co., Limited, 106 Cannon street, London, E. C. 4, and Winchester street, Silvertown, London, E. 16.

420,293 INVULNER—puncture-closing medium composed principally of cellulose, for pneumatic tires. J. Houdry & Fils, 1 avenue de Villars, Paris, France. Address for service in the United Kingdom, care of Phillips & Leigh, 14-15 Southampton Buildings, Chancery Lane, London, W. C. 2.

420,839 ELONGAITER—tire-repair patching material. Chas. L. Cuthbe & Co., 37 Great Eastern street, London, E. C. 2.

420,891 "FLEXICORD"—tires. The India Rubber, Gutta Percha & Telegraph Works Co., Limited, 106 Cannon street, London, E. C. 4.

Published February 22, 1922

420,062 NAPARU—goods manufactured from rubber and gutta percha, not included in classes other than No. 40, but not including tires. The Nalla Farl Rubber Syndicate, 12-12 Union Row, Aberdeen.

490,195 BROLINO superimposed above the upper of two squares, with checkerboard borders, placed one above the other diagonally—rubber sheeting. Broadhurst & Co., Limited, 4 Gibbon street, Bradford, Manchester, Lancashire.

B420,228 PARACORE—electric cables. United States Rubber Co., New Brunswick, New Jersey, and 1790 Broadway, New York, N. Y.—both in U. S. A. Address for service in the United Kingdom, care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W. C. 2.

421,592 Representation of a man's head in warrior's helmet—rubber pads for boots and shoes. Blakey's Boot Protectors, Limited, Armley Malleable Ironworks, Modder Place, Armley, Leeds.

421,593 Representation of a woman's head in Amazon's headdress—rubber pads for boots and shoes. Blakey's Boot Protectors, Limited, Armley Malleable Ironworks, Modder Place, Armley, Leeds.

The Dominion of Canada

Registered

30,250 GENERAL—tires of all kinds, tubes, repair accessories, mechanical goods, heels, mats, packing, tubing, etc. The General Tire & Rubber Co., Akron, Ohio, U. S. A.

30,252 ADAMS FRUITS AND FLOWERS together with fanciful design—chewing gum. Canadian Chewing Gum Co., Limited, Toronto, Ont.

30,253 ADAMS TEMPTERS—chewing gum. Canadian Chewing Gum Co., Limited, Toronto, Ont.

30,254 ADAMS REGAL MINTS—chewing gum. Canadian Chewing Gum Co., Limited, Toronto, Ont.

30,255 ADAMS KIS-ME—chewing gum. Canadian Chewing Gum Co., Limited, Toronto, Ont.

30,387 Representation of a globe surmounted by an eagle, a scroll across the globe, the words EAGLE BRAND on the scroll, the word RUBBER above the scroll, and the word Toys below—rubber toys. The Eagle Rubber Co., Ashland, Ohio.

New Zealand

Published December 31, 1921; Issued January 31, 1922

14,246 THE LION TYRE—tires. The North British Rubber Co., Limited, Castle Mills, Fountainbridge, Edinburgh, Scotland.

18,557 PRESIDENT—sole pads. Phillips Patents, Limited, 142-146 Old street, London, E. C. 1., Eng.

18,558 LISTERATED—chewing gum. Listerated Gum Corporation, 50 Union Square and 42 Park Place, New York City, U. S. A.

18,559 REDDAWAY—machine belting, etc. F. Reddaway & Co., Limited, Victoria Mills, Cheltenham street, Pendleton, Manchester, Eng.

18,560 REDDAWAY—hose. F. Reddaway & Co., Limited, Victoria Mills, Cheltenham street, Pendleton, Manchester, Eng.

Argentina

The application for the registering of the trade-mark "Estrella," meaning "Star," by Chiesa Hermanos, of Buenos Aires, under date of September 6, 1921, has been recently announced in the *Boletin Oficial* of Argentina. The application covers many varieties of goods, including india rubber, gum, and gutta percha, crude and also in every state of preparation, and all articles made thereof, except those used in electricity, surgery, or orthopedia. American owners of the trade-mark "Star," who are dealing in goods similar to those mentioned in the above application, and who have not authorized this Argentine firm to obtain registration of the trade-mark, are advised to institute action for annulment.

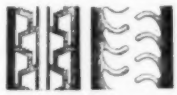
REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients," also "Rubber Machinery."

Designs

United States

Patented February 7, 1922

60,315 Rubber heel. Term 14 years. R. Caterini, Archbald, Pa.
60,326 Rubber heel. Term 7 years. O. Eick, St. Louis, Mo.
60,343 Tire. Term 7 years. P. H. Heater, Bucyrus, O.
60,366 Resilient heel lift. Term 14 years. L. M. Oakley, assignor to Essex Rubber Co.—both of Trenton, N. J.



60,343 60,443

Patented February 14, 1922

50,428 Rubber heel. Term 14 years. G. F. Quinn, assignor to Simplex Rubber Co.—both of Boston, Mass.

Patented February 21, 1922

60,443 Tire tread. Term 14 years. A. A. Bush, assignor to The Oldfield Tire Co.—both of Akron, O.
60,447 Sponge rubber doll. Term 3½ years. Rees Davis, Chicago, Ill.
60,451 Rubber heel. Term 3½ years. A. A. Glidden, Watertown, and L. E. Best, Boston, assignors to Hood Rubber Co., Watertown—both in Mass.
60,472 Rubber heel tread. Term 14 years. G. L. Spencer, Cleveland, O.

The Dominion of Canada

5,329 Sole and heel. Patented February 3, 1922. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

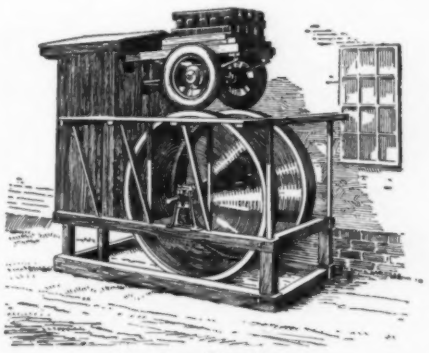
Germany

Design Patents Issued, with Dates of Issue

803,837 (December 19, 1921) Unstretchable driving belt. Walter Kirchof, Kaiserstrasse 61, Bielefeld.
804,044 (December 23, 1921) Non-skid tread for pneumatic tires. Paul Repenning, Rendsburg.
804,180 (December 13, 1921) Flexible rubber ruler for drawing curves. W. Arndt, Grossmannstrasse 1, Dresden.
804,365 (December 24, 1921) Rubber goods with colored relief patterns. Zieger & Wiegand, Leipzig-Volkmarsdorf.
804,783 (October 28, 1921) Pneumatic tire. Hans Rudolf Kindhauser, Ragaz, Switzerland; represented by: W. Liebenow, Friedrichstrasse 201, Berlin.
804,784 (November 15, 1921) Rubber sole. Aug. Glockner, Peterstrasse 6, Worms.
804,790 (December 15, 1921) Rubber heel that can be slipped on the shoe heel. Friedrich Brehme, Hellkampstrasse 5, Gelsenkirchen.
804,803 (December 30, 1921) Pessary. Richard Poppe, Demmeringstrasse 87, Leipzig-Lindenau.
804,889 (July 6, 1921) Binder. Clara Menkes, née Folkenfolk, Konigsjohannstrasse 33, Leipzig.
804,973 (December 23, 1921) Sanitary binder. Anna Werner, Mittererstrasse 11, Munich.
805,361 (December 29, 1921) Sporting belt of rubber plates with or without pattern in fabric in different colors. Matthias Braun, Hans-Sachsstrasse 44, Köln-Lindenthal.
805,572 (December 8, 1921) Rupture band. Hermann Fechner, Niederlossnitz, near Dresden.

MACHINE FOR TESTING TIRES

Converse tires are ruthlessly tested for possible flaws, and a special machine for this purpose has been devised by the Converse Tire Co., Malden, Massachusetts. The device has proved very successful, as it imitates very closely the wear and tear incident to actual road usage. The machine is simply the rear assembly of a passenger car chassis. Power is delivered directly from a motor to a flywheel so that the rear wheels receive their impulse through the shaft and differentials. The car itself is heavily loaded, and it is the friction of this weight resting on the drums which cause the latter to revolve. A speedometer, reporting the mileage, often indicates 20,000 miles.



Converse Tire Tester

Review of the Crude Rubber Market

New York

DURING the last week of February the market was very quiet and dull, but with some scattered factory buying. New York prices held quiet at 15¼ to 15½ cents for spot. There was no large business and prices eased off unexpectedly when the market became quite active, spot rib smoked sheets selling for 14½ cents. Parás were fairly active, balata and guttas inactive.

The first week in March was also dull and weak, opening at 15 cents and declining to 14 cents for spot by the next day. Reports from London indicated that a sliding scale export tax would be imposed on plantation rubber after shipment of 150,000 tons had been made. This report acted to stiffen the market for spot rubber to 15-15¼ cents. Parás were dead and balatas neglected and steady.

As the month advanced, dullness continued without reaction. There was scattered buying for factory consumption at prices ½-cent under the market, which offered ribbed smoked sheets at 15 cents.

The last two weeks of March showed only increasing lack of interest with a decline of spot ½-cent to 14½ cents. Buying was scattered and in small lots only. Parás, balata and guttas were very quiet and without interest.

Importations of all grades during February were 28,973 tons compared with 8,839 tons for February one year ago. Plantation arrivals for February were 48,044 tons compared with 20,732 tons for February one year ago.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. March 4. Spot, first latex crêpe, 15 cents; April-June, 16 cents; July-September, 17 cents; July-December, 17½ cents. March 27. Spot, first latex crêpe, 14½-15 cents; May-June, 15-15½ cents; July-September, 16-16½ cents; July-December, 16½ cents.

March 4. Spot, ribbed smoked sheets, 15¼ cents; April-June, 16¼ cents; July-September, 17¼ cents; July-December, 17¾ cents. March 27. Spot, ribbed smoked sheets, 14½ cents; May-June, 15-15½ cents; July-September, 16 cents; July-December, 16½ cents.

March 4. Spot, No. 1 amber crêpe, 14¾ cents; April-June, 15¾ cents. March 27. Spot, No. 1 amber crêpe, 14-14½ cents; May-June, 14½-14¾ cents.

March 4. Spot, No. 1 rolled brown crêpe, 12¼-12½ cents; April-June, 12¾ cents. March 27. Spot, No. 1 rolled brown crêpe, 12½ cents; May-June, 13 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. March 4. Spot, upriver fine, 17 cents; islands fine, 16¼ cents; upriver coarse, 12¾ cents; islands coarse, 7½ cents; Cametá, 9 cents; caucho ball, 12¾-13 cents. March 27. Spot, upriver fine, 17½ cents; islands fine, 17 cents; upriver coarse, 13 cents; islands coarse, 8 cents; Cametá, 9½ cents; caucho ball, 11½-13 cents.

London

During the past month the London rubber market has been generally dull with ribbed smoked sheets ruling rather close to 8 pence for spot. Sterling exchange, demand, has fluctuated from $4.27½ to $4.43⅝, the high point being reached February 28 and the low one, March 14. On March 25 exchange was $4.38⅜.

London crude rubber authorities are not hopeful of improved prospects in view of the adverse effect of reduction in American demand and heavy shipments from the Far East. A report from London to the United States Department of Commerce attributes the low-price level of the last of February to heavy shipments from the plantations in anticipation of improved demand. Output of 197 London-managed estates shows for January, 4500 tons as compared with 3400 tons for January, 1921.

The general attitude of the market is one of awaiting developments and continues without definite character. Falling stocks are offset by absence of demand from factories.

New York Quotations

Following are the New York spot quotations, for one year and one month ago, and March 27, the current date:

	April 1, 1921	March 1, 1922	March 27, 1922
Plantation Hevea			
First latex crêpe	$0.18½@.19	$0.15¼@	$0.14½@
Off latex crêpe	.17 @.18	.14½@.14¾	.14 @
Amber crêpe No. 1	.15½@.16	.15 @.15¾	.14 @.14½
Amber crêpe No. 2	.14½@.15	.14¾@	.13¾@.14
Amber crêpe No. 3	.13½@.14	.14¼@	.13½@
Brown crêpe, thick and thin	.13½@.14	.14 @	.13½@
Brown crêpe, specky	.11 @.12	.13 @	.12 @.13
Brown crêpe, rolled	.12 @	.13¼@.13½	.12½@
Smoked sheet, ribbed	.16½@	.15¼@.15½	.14½@
Smoked sheet, plain	.15 @.16	.14½@.14¾	.14 @
Unsmoked sheet	.15 @	.14 @.14½	.14 @
Colombo scrap No. 1	.11 @	.13½@.14	.12 @.12½
Colombo scrap No. 2	.09 @	.13 @	.10¾@.11
East Indian			
PONTIANAK			
Banjermassin	.07 @	.08½@	.08 @
Palembang	.09 @	.10½@	.10 @
Pressed block	.11¾@	.13 @	.13 @
Sarawak	.06 @	.08 @	.06¾@
South American			
PARAS			
Upriver, fine	.17 @.17½	.18 @.18¼	.17½@.17¾
Upriver, medium	.14 @	.17 @	.16 @.17
Upriver, coarse	.10 @	.13 @	.13 @
Upriver, weak, fine	.11½@.12	.15 @.16	.15 @.16
Islands, fine	.17 @	.17 @.17¼	.16¾@.17
Islands, medium	.13 @	.15 @.15½	.15 @.15½
Islands, coarse	.12 @	.08 @	.08 @.08½
Acre Bolivian, fine	.18 @	.18½@	.18 @
Beni Bolivian	@	.18½@.19	.18½@.19
Cametá	.10½@	.09½@.10	.09½@
Madeira, fine	.19½@.20	.19 @.19¼	.19 @.20
Peruvian, fine	.16 @	.17 @.17½	.16½@.16¾
Tapajos, fine	.16 @.16½	.17 @.17½	.16 @.16¾
CAUCHO			
Upper caucho ball	.14 @	.12¼@.12½	.13 @
Lower caucho ball	.10½@	.11½@	.11½@
Maniçobas			
Ceará negro heads	.10 @	*.11 @	*.11 @
Ceará scrap	.05 @	*.07 @	*.07 @
Maniçoba 30% guaranty	.09½@.10	*.08½@	*.08½@
Mangabeira thin sheet	.12 @	*.14 @	*.14 @
Centrals			
Central scrap	.11 @.12	.08 @.10	.09 @.10½
Central scrap and strip	.08 @.09	.07 @.09	.08 @.09
Central wet sheet	.05 @.07	.03 @.04	.04 @.06
Corinto scrap	.11 @.12	.09 @.11	.09 @.10½
Esmeralda sausage	.11 @.12	.09 @.11	.09 @.10½
Guayule, 20% guaranty	@	@	@
Guayule washed and dried	*.26 @	.26 @	.26 @
Africans			
Benguela, No. 1, 28½%	@	.09 @	.09 @
Benguela, No. 2, 32½%	@	@	.07 @
Conakry niggers	@	.18 @	.17 @
Congo prime, black upper	@	.15½@	.14½@
Congo prime, red upper	@	.15½@	.14 @
Kassai, black	@	.15½@	.14 @
red	@	.15½@	.10 @.12
Massai sheets and strings	@	.18 @	.17 @
Niger flake, prime	@	.14½@	.14½@
Rio Nunez ball	@	@	@
Rio Nunez sheets, strings	@	.18 @	.17 @.18
Gutta Percha			
Gutta Siak	.15½@	.18¼@	.17¾@.18
Red Macassar	2.25 @	2.80 @	3.00 @
Balata			
Block, Ciudad, Bolivar	.56 @	.52 @.53	.51 @
Colombian	.47 @.48	.40 @.42	.46 @
Panama	.46 @.47	.25 @.38	.45 @
Surinam sheet	.68 @.69	.63 @.64	.67 @
amber	.80 @.82	.68 @.70	.72 @

*Nominal.

Reclaimed Rubber

The continued low prices for crude rubber and the slow revival of rubber manufacturing activity in essentially all lines except tires and heels, hold down the demand for reclaims which in more advanced practice is set aside in favor of crude rubber.

Reclaiming plants generally are operating at about 25 per cent capacity and the business continues to be on the same basis as last fall, with a dull outlook.

New York Quotations

MARCH 27, 1922

Prices subject to change without notice

STANDARD RECLAIMS		
Floating	$0.12	@$0.13
Friction	.12	@ .13
Mechanical	.08	@ .10
Shoe	.10¼	@ .10¼
Tires, auto	.09	@ .10
truck	.09	@ .10
White	.13	@ .14

Comparative Low and High New York Spot Rubber Prices

	March		
	1922*	1921	1920
PLANTATIONS			
First latex crêpe	$0.13¾@$0.15	$0.18 @$0.19½	$0.46 @$0.48¼
Smoked sheet, ribbed	.13¾@ .15¼	.16¼@ .18	.46 @ .48
PARAS			
Upriver, fine	.17 @ .17¾	.17 @ .18	.41½@ .43
Upriver, coarse	.12 @ .13	.11¼@ .12	.31¼@ .31¾
Islands, fine	.16 @ .17½	.17 @ .18	.41½@ .44½
Islands, coarse	.07½@ ...	.11 @ .12	.21½@ .22
Cametá	.09 @ .11	.11 @ ..	.21½@ .22

*Figured to March 27, 1922.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of March 10, 1922:

This week's movement has been similar to that of last week, at first decline, subsequently a quick recovery; good demand throughout, but sellers rather reluctant.

Fluctuations were as follows: Crêpe spot 45½-43-45 cents, April to June 47½-45-47, October to December 52-48½-51½.

The turnover in sheets was unimportant.

The close is firm at about following quotations:

Hevea crêpe, Fl. .45.	Sheets, Fl. .45½	spot.
Hevea crêpe, Fl. .47.	Sheets, Fl. .47	April to June.
Hevea crêpe, Fl. .49.	Sheets, Fl. .49	July to September.
Hevea crêpe, Fl. .51.	Sheets, Fl. .51	October to December.

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, reports under date of February 9, 1922:

The local rubber market has remained quietly steady at the decline, spot sheet and crêpe showing no change. Forward positions have fluctuated somewhat, illustrating the uncertain state of the market.

For the auctions yesterday 887 tons were cataloged for sale. All grades were in good demand at prices fully up to the level of last week. Palish crêpes were again in request, fine browns were keenly competed for, and sold up to 27 cents.

The amount sold was 676 tons.

The following is the course of values:

	In Singapore per pound	Sterling Equivalent per Pound in London
Sheet, fine ribbed smoked	30½ @ 31	—/10 @ —/10½
Sheet, good F. A. Q	29½ @ 30	— /9¼ @ — /9⅜
Sheet, off quality	24 @ 29	— /8¼ @ — /9⅜
Crêpe, fine pale	29½ @ 30	—/10¼ @ —/10⅜
Crêpe, good pale	28½ @ 29½	— /9⅞ @ —/10¼
Crêpe, off quality	26 @ 28	— /9¼ @ — /9¾
Crêpe, fine brown	25½ @ 27	— /9⅛ @ — /9½
Crêpe, good brown	22 @ 25	— /8½ @ — /9
Crêpe, dark	20 @ 24½	— /7⅝ @ — /8⅜
Crêpe, bark	18½ @ 22½	— /7⅛ @ — /8¼

Plantation Rubber Exports from Java, 1920-1921*

	December		Twelve Months Ended December 30	
	1920	1921	1920	1921
To Netherlands ...kilos	418,000	315,000	5,011,000	5,315,000
Great Britain	739,000	253,000	8,802,000	7,307,000
Germany	37,000	100,000	146,000	703,000
United States	522,000	1,101,000	12,058,000	12,544,000
Singapore	258,000	235,000	4,427,000	2,854,000
Japan	.....	.....	194,000	281,000
Australia	18,000	6,000	252,000	217,000
Other countries	54,000	16,000	256,000	177,000
Totals...kilos	2,046,000	2,026,000	31,146,000	29,398,000
Ports of Origin:				
Tandjong Priok...kilos	853,000	810,000	14,570,000	12,942,000
Samarang	31,000	122,000	506,000	556,000
Soerabaya	1,099,000	845,000	14,926,000	13,543,000

*The October figures are verified.

Rubber Exports from British Malaya

The Registrar of Imports and Exports at Singapore has issued the following statement of the total exports of rubber from all the ports of British Malaya in 1921.

	December, 1921	Total for 1921	Total for 1920
United Kingdom...pounds	7,236,500	101,928,400	157,884,200
United States	29,393,900	232,394,800	264,971,700
Europe	1,284,900	14,773,600	12,437,400
British Possessions	462,800	6,304,600	13,341,900
Japan	2,735,300	43,789,600	13,201,000
Other foreign countries	500	203,200	408,700
Totals ...pounds	41,113,900	399,394,200	462,244,900

The imports from foreign countries in December amounted to 60,432 centals (6,042,200 pounds valued at £183,170). The approximate value of last year's exports was £14,183,050, as against £41,321,930 in 1920.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

	February, 1922								March, 1922													
	20	21	22*	23	24	25	27	28	1	2	3	4	6	7	8	9	10	11	13	14	15	16	17	18
PLANTATIONS																								
Sheet																								
Ribbed smoked	15⅜	15⅜	....	15⅜	14⅞	14⅞	14⅜	14⅜	14	14½	15⅛	15⅛	14½	14⅜	14⅜	15⅛	14¾	14¾	14⅜	14⅝	14⅞	14¾	14⅝	14⅝
Crepe																								
First latex	15¼	15⅛	....	14¾	14¾	14¾	14⅛	13⅞	13⅞	14¼	14⅞	14⅞	14¼	13⅞	14¼	15	14⅝	14⅝	14⅜	14⅝	14¾	14¾	14½	14½
Off latex	14⅝	14⅝	....	14¼	14¼	14¼	13⅝	13⅞	13⅜	13⅝	14⅛	14⅛	13¾	13⅜	13⅜	14¾	14¼	14¼	14⅛	14¼	14¼	14⅜	14¼	14¼
No. 1 blanket	15⅜	14⅝	....	14¾	14¾	14¾	14	14¼	13¾	14⅛	14¾	14¾	14¼	13¾	13⅞	14⅝	14½	14¼	14¼	14⅝	14⅜	14¾	14¼	14¼
No. 2 blanket	14⅜	14¼	....	14½	14¼	14¼	13¾	13¾	13¼	13⅝	14⅜	14⅜	13¾	13½	13½	13⅞	13⅜	13¾	13¾	13⅞	13⅞	13⅞	13¾	13¾
No. 3 blanket	14	13½	....	14	13¾	13¾	13½	13¼	12¾	13⅜	13¾	13¾	13½	12¾	12⅞	13⅜	13½	13¼	13¼	13¼	13⅜	13⅜	13¼	13¼
Thin, clean, brown	14	13¾	....	13⅞	13¾	13¾	13½	13¼	12⅞	13⅜	13⅝	13⅝	13½	12¾	12⅞	13¾	13½	13¼	13¼	13⅜	13¼	13¼	13½	13½
Specky brown	13⅝	13¼	....	13½	13¼	13¼	13	12¾	12⅜	12⅝	13¼	13¼	12¾	12½	12⅝	13¼	12¾	12¾	12⅞	13	12¾	12¾	13	13
Rolled brown	12¾	12¾	....	12¾	12¾	12¾	12⅜	12½	12⅛	12⅛	12¾	12¾	12½	12⅛	12⅛	12⅝	12⅛	12⅜	12⅜	12½	12¼	12¼	12½	12½

*Holiday.

United States Crude and Waste Rubber Imports for 1922 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1922	Totals 1921	Balata	Miscellaneous	Waste
January ...tons	20,774	916	161	16	....	....	21,867	14,177	42	126	85
February	27,270	1,347	301	14	....	41	28,973	8,839	28	448	6
Totals, 2 months, 1922.tons	48,044	2,263	462	30	....	41	50,840	....	70	574	91
Totals, 2 months, 1921....	20,732	1,744	312	5	223	....	....	23,016	66	389	1,108

Compiled by The Rubber Association of America, Inc.

British Malaya Rubber Exports

An official telegram from Singapore states that 42,474,800 pounds of rubber (18,962 tons) were exported from British Malaya in the month of January as against 41,113,900 pounds (18,354 tons) in December.

Transhipments amounted to 5,459,000 pounds (2,437 tons) against 3,711,400 pounds (1,657 tons) in December last.

Exports of Crude Rubber from Pará and Manáos, Brazil, to the United States and Europe

Grade	January, 1922 To United States Pounds	To Europe Pounds
From Pará		
Fine	578,272	968,874
Medium	39,341	27,341
Coarse	302,796	17,107
Caucho	245,934	508,950
Totals	1,166,343	1,522,272
From Manáos:		
Fine	221,798	793,281
Medium	25,309	70,671
Coarse	286,095	15,509
Caucho	187,024	60,975
Totals	720,226	940,436
Total exports during Jan., 1922	1,886,569	2,462,708

	Pounds
Grand total during January, 1922	4,349,277
Grand total during January, 1921	3,802,053
Increase during month of January, 1922	547,224

No exports of rubber from Itacoatiara, Brazil, and Iquitos, Peru, during January, 1922, whereas the figures for January, 1921, include 71,497 pounds shipped from Iquitos, Peru.

Rubber Division, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Crude Rubber Arrivals at New York as Stated by Ships' Manifests

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Total Pounds
FEBRUARY 12. By "Stephen," Pará.					
Poel & Kelly, Inc.	.....	.....	50,500	.....	.....
FEBRUARY 19. By "Polycarp," Pará.					
Paul Bertuch	451,820	15,547	2,334	.....	469,701
L. Littlejohn & Co., Inc.	122,696	.....	.....	.....	122,696
Poel & Kelly, Inc.	143,124	.....	64,872	84,577	292,573
Meyer & Brown, Inc.	*88,480	.....	.....	.....	88,480
FEBRUARY 19. By "West Corum," Montevideo.					
Neuss, Hesslein & Co.	.....	.....	.....	89,460	89,460
MARCH 3. By "Bruyere," Pará.					
H. A. Astlett & Co.	.....	.....	.....	56,000	56,000
Baird Rubber & Trading Co., Inc.	17,800	12,480	23,810	.....	30,280
L. Littlejohn & Co., Inc.	98,279	.....	.....	.....	98,279
Meyer & Brown, Inc.	*56,000	.....	.....	.....	56,000
MARCH 7. By "Southern Cross," Montevideo.					
Neuss, Hesslein & Co.	103,590	.....	18,540	.....	122,130
MARCH 8. By "Poconé," Rio de Janeiro.					
H. A. Astlett & Co.	.....	.....	.....	.....	270
MARCH 14. By "Dominic," Pará.					
L. Littlejohn Co., Inc.	94,451	.....	.....	.....	94,451
Meyer & Brown, Inc.	*16,800	.....	.....	.....	16,800
MARCH 16. By "Virgil," Pará.					
H. A. Astlett & Co.	22,400	11,200	.....	.....	33,600

*Includes medium.

Plantations

(Figured at 180 pounds net to the bale or case.)

	Pounds	Totals
FEBRUARY 15. By "Verbania," London.		
Fred Stern & Co.	471,280	
Thornett & Fehr, Inc.	8,100	
Various	120,600	599,980
FEBRUARY 16. By "Madawaska," Far East.		
H. A. Astlett & Co.	11,200	
Baring Bros.	151,200	
General Rubber Co.	198,000	
The Goodyear Tire & Rubber Co.	78,400	
Jaeger & Co.	72,540	
F. R. Henderson & Co.	15,680	
Various	459,560	986,580
FEBRUARY 17. By "Sanuki Maru," Far East.		
Continental Rubber Co., of New York	22,400	
Fred Stern & Co.	150,080	
General Rubber Co.	1,080,000	
F. R. Henderson & Co.	470,400	
Various	832,080	2,555,680
FEBRUARY 19. By "Veendyk," Far East.		
H. A. Astlett & Co.	56,000	
American Trading Co.	20,880	
Poel & Kelly, Inc.	34,560	
Chas. T. Wilson Co., Inc.	10,620	
F. R. Henderson & Co.	11,200	
International Products Co.	10,620	
Jaeger & Co.	13,680	
Weise & Co.	94,140	
Various	912,960	1,164,660
FEBRUARY 21. By "Siam City," Liverpool.		
L. Littlejohn & Co., Inc.	55,957	
F. R. Henderson & Co.	67,200	
Various	4,450,643	4,573,800
FEBRUARY 21. By "Noordam," Rotterdam.		
Various	.....	84,960
FEBRUARY 21. By "Kandahar," Colombo.		
W. R. Grace & Co.	6,300	
Pacific Trading Corporation of America	42,840	
Thornett & Fehr, Inc.	50,400	
Whittall & Co. of Ceylon	163,800	
General Rubber Co.	468,000	
Various	125,800	857,140
FEBRUARY 22. By "Maine," London.		
Aldens' Successors, Inc.	182,160	
Michelin Tire Co.	42,120	
Various	180	224,460
FEBRUARY 22. By "Algie," Far East.		
Baird Rubber & Trading Co., Inc.	11,200	
L. Littlejohn & Co., Inc.	38,080	
Fred Stern & Co.	38,160	
Various	83,335	170,775
FEBRUARY 24. By "Scythia," Liverpool.		
Thornett & Fehr, Inc.	25,920	
Poel & Kelly, Inc.	80,600	106,520
FEBRUARY 25. By "Bowes Castle," Far East.		
Firestone Tire & Rubber Co.	542,880	
Thos. A. Desmond & Co.	108,000	
L. Littlejohn & Co., Inc.	1,008,000	
Pell & Dumont, Inc.	93,060	
E. G. Curry Co., Inc.	342,000	
Poel & Kelly, Inc.	342,000	
H. Muehlstein & Co.	27,000	
Baring Bros.	156,240	
Fred Stern & Co., Inc.	400,940	
L. B. Peterson	14,040	
F. R. Renderson & Co.	441,280	
William H. Stiles & Co.	27,000	
Hood Rubber Co.	22,400	
J. T. Johnstone & Co., Inc.	527,384	
Joosten & Janssen	33,600	
Aldens' Successors, Inc.	111,783	
H. A. Astlett & Co.	112,000	
Baird Rubber & Trading Co., Inc.	168,000	
Chas. T. Wilson Co., Inc.	224,000	
Schafer & Meyer	179,200	
Various	2,067,073	6,623,880
FEBRUARY 27. By "Knight of the Garter," Far East.		
Hood Rubber Co.	156,800	
J. T. Johnstone & Co., Inc.	269,600	
Meyer & Brown, Inc.	459,200	
Poel & Kelly, Inc.	1,035,051	
L. Littlejohn & Co., Inc.	1,461,254	
Schafer & Meyer	56,000	
Balfour, Williamson & Co.	147,960	
Fred Stern & Co.	531,215	
H. Muehlstein & Co.	112,320	
F. R. Henderson & Co.	705,600	
Phelan, Borland & Fearons	73,620	
Chas. T. Wilson Co., Inc.	504,000	
William H. Stiles & Co.	91,800	
Thornett & Fehr, Inc.	106,560	
Aldens' Successors, Inc.	235,445	
Firestone Tire & Rubber Co.	713,520	
H. A. Astlett Co.	224,000	
The Goodyear Tire & Rubber Co.	567,900	
Various	2,069,255	9,521,100
FEBRUARY 28. By "Minian," London.		
Aldens' Successors, Inc.	112,395	
General Rubber Co.	94,500	
L. Littlejohn & Co., Inc.	85,070	
Various	55,795	347,760
FEBRUARY 28. By "Celtic," Liverpool.		
Henderson, Forbes & Co.	.....	328,860
MARCH 3. By "Clearwater," Batavia.		
H. A. Astlett & Co.	145,600	
Baird Rubber & Trading Co., Inc.	78,400	
The Goodyear Tire & Rubber Co.	210,417	
Jaeger & Co.	235,440	
L. Littlejohn & Co., Inc.	450,731	
Meyer & Brown, Inc.	100,800	
Poel & Kelly, Inc.	196,413	
Fred Stern & Co.	190,340	
Thornett & Fehr, Inc.	27,720	
Chas. T. Wilson Co., Inc.	22,400	
F. R. Henderson & Co.	512,960	
Various	2,238,999	4,409,820
MARCH 6. By "Yangtsze," Far East.		
Aldens' Successors, Inc.	16,800	
H. A. Astlett Co.	112,000	
Baird Rubber & Trading Co., Inc.	22,400	
Continental Rubber Company of New York	3,240	
Hood Rubber Co.	55,979	
F. R. Henderson & Co.	562,240	
General Rubber Co.	1,281,240	
J. T. Johnstone & Co., Inc.	98,560	
L. Littlejohn & Co., Inc.	1,441,822	
Meyer & Brown, Inc.	459,200	
Poel & Kelly, Inc.	174,955	
The Goodyear Tire & Rubber Co.	221,777	
American Trading Co.	135,360	
Fred Stern & Co.	331,243	
Chas. T. Wilson Co., Inc.	250,880	
Schafer & Meyer	78,400	
Various	865,662	6,111,718
MARCH 6. By "Katuna," Far East.		
American Trading Co.	216,180	
Baird Rubber & Trading Co., Inc.	140,000	
Continental Rubber Co. of New York	57,720	
Firestone Tire & Rubber Co.	504,000	
General Rubber Co.	330,300	
Hood Rubber Co.	67,047	
J. T. Johnstone & Co., Inc.	82,880	
Jaeger & Co.	268,380	
L. Littlejohn & Co., Inc.	800,595	
Meyer & Brown, Inc.	640,640	
Phelan, Borland & Fearons	52,920	
Poel & Kelly, Inc.	1,021,752	
William H. Stiles & Co.	85,680	
Fred Stern & Co.	309,039	
Thornett & Fehr, Inc.	305,280	

	Pounds	Totals
Chas. T. Wilson Co., Inc....	67,200	
The Goodyear Tire & Rubber Co.	467,175	
F. R. Henderson & Co.....	168,000	
Various	1,934,172	7,518,960
MARCH 8. By "Vasconia," London.		
General Rubber Co.....	63,540	
L. Littlejohn & Co., Inc.....	86,877	
Poel & Kelly, Inc.....	386,900	
Fred Stern & Co.....	13,527	
Thornett & Fehr, Inc.....	113,760	
Schafer & Meyer	188,160	852,764
MARCH 10. By "Sagadahoc," Far East.		
H. A. Astlett & Co.....	47,000	
Baird Rubber & Trading Co., Inc.	67,200	
Continental Rubber Co., of New York	11,200	
Firestone Tire & Rubber Co..	620,640	
The Goodyear Tire & Rubber Co.	163,762	
Hood Rubber Co.....	56,040	
F. R. Henderson & Co.....	1,662,080	
Jaeger & Co.....	76,320	
L. Littlejohn & Co., Inc.....	1,030,040	
H. Muehlstein & Co.....	67,500	
Manhattan Rubber Mfg. Co..	29,160	
Poel & Kelly, Inc.....	117,800	
Fred Stern & Co.....	36,280	
East Asiatic Co.....	117,000	
Chas. T. Wilson Co., Inc....	20,160	
Schafer & Meyer.....	22,400	
William H. Stiles & Co.....	210,060	
Various	210,638	4,565,280
MARCH 10. By "Roseric," Far East.		
Hood Rubber Co.....	.....	52,950
MARCH 12. By "Michigan," London.		
Aldens' Successors, Inc.....	245,648	
Continental Rubber Co., of New York	22,400	
L. Littlejohn & Co., Inc....	439,506	707,554
MARCH 12. By "Banda," Far East.		
Aldens' Successors, Inc.....	44,754	
H. A. Astlett & Co.....	56,000	
L. Littlejohn & Co., Inc.....	209,900	
Poel & Kelly, Inc.....	23,383	
Fred Stern & Co.....	11,237	445,274
MARCH 13. By "Valacea," London.		
L. Littlejohn & Co., Inc.....	55,714	
Various	12,326	68,040
MARCH 14. By "Westerdyk," Rotterdam.		
Aldens' Successors, Inc.....	22,500	
Various	9,900	32,400
MARCH 14. By "King City," London.		
F. R. Henderson & Co.....	.....	268,800
MARCH 15. By "City of Lucknow," Far East.		
Hood Rubber Co.....	.....	38,100
MARCH 15. By "Creole State," Far East.		
L. Littlejohn & Co., Inc....	168,000	
Chas. T. Wilson Co., Inc....	134,400	302,400
MARCH 19. By "Nieuw Amsterdam," Rotterdam.		
Various	.....	70,760

	Pounds	Totals
MARCH 20. By "Tsushima Maru," Far East.		
Baird Rubber & Trading Co., Inc.	33,600	
The Goodyear Tire & Rubber Co.	83,120	
Various	1,119,943	1,236,660
MARCH 21. By "Oanfa," Far East.		
Chas. T. Wilson Co., Inc....	194,880	

Pontianak

FEBRUARY 25. By "Bowes Castle," Far East.		
Chas. T. Wilson Co., Inc....	3,300	
Various	302,100	305,400
FEBRUARY 27. By "Knight of the Garter," Far East.		
Various	.....	127,200
MARCH 6. By "Yangtsze," Far East.		
Various	.....	15,900
MARCH 6. By "Katuna," Far East.		
Various	.....	60,600
MARCH 10. By "Sagadahoc," Far East.		
Fred Stern & Co.....	23,433	
Jaeger & Co.....	366,600	
Various	157,167	547,200

Guayule

MARCH 10. By "El Mundo," Mexico.		
Continental Rubber Co. of New York	.....	121,000
MARCH 17. By "North American," Cristobal.		
Various	.....	3,311

Centrals

FEBRUARY 23. By "Sarpfos," Bahia de Cara.		
Ultramares Corporation	5,618	
Various	9,172	14,790
FEBRUARY 23. By "Panama," Cristobal.		
Ultramares Corporation	5,750	
Various	1,265	7,015
FEBRUARY 25. By "G. W. Goethals," Cristobal.		
Ultramares Corporation	.....	2,250
MARCH 1. By "Alvarado," Bahia de Cara.		
Ultramares Corporation	.....	6,250
MARCH 14. By "Panama," Cristobal.		
Ultramares Corporation.....	.....	7,759

Africans

FEBRUARY 16. By "Mineola," West Coast of Africa.		
Various	.....	1,890
FEBRUARY 17. By "Gathland," Antwerp.		
Various	.....	70,380
FEBRUARY 20. By "Aldgate," Marseilles.		
Silva, Busseinus & Co.....	.....	420,555
FEBRUARY 21. By "Cedric," Liverpool.		
Baird Rubber & Trading Co., Inc.	.....	56,000

	Pounds	Totals
FEBRUARY 24. By "Texan," Liverpool.		
Various	.....	148,235
FEBRUARY 27. By "Schodack," Havre.		
Various	.....	4,830
FEBRUARY 28. By "Celtic," Liverpool.		
Fred Stern & Co.....	.....	2,235
MARCH 4. By "Allestan," Lisbon.		
Various	.....	509,220
MARCH 7. By "Braya," Marseilles.		
Various	.....	137,880
MARCH 14. By "Finland," Antwerp.		
Various	.....	1,350

Gutta Percha

FEBRUARY 25. By "Bowes Castle," Far East.		
Various	.....	37,800
MARCH 6. By "Yangtsze," Far East.		
Various	.....	61,500
MARCH 10. By "Sagadahoc," Far East.		
Various	.....	65,400

Gutta Siak

FEBRUARY 27. By "Knight of the Garter," Far East.		
Various	.....	388,200
MARCH 3. By "Clearwater," Far East.		
Fred Stern & Co.....	11,200	
Various	800	12,000
MARCH 10. By "Sagadahoc," Far East.		
Various	.....	6,000

Balata

FEBRUARY 15. By "Gen. H. F. Hodges," Cristobal.		
J. S. Sembrada & Co.....	1,380	
Various	230	1,610
FEBRUARY 21. By "Mayaro," Trinidad.		
Ultramares Corporation	45,150	
Various	450	45,600
FEBRUARY 22. By "Prins Frederick Hendrick," Paramaribo.		
Middleton & Co., Limited....	2,484	
William Schall & Co.....	10,800	13,284
FEBRUARY 24. By "Wm. Tupper," Paramaribo.		
Middleton & Co., Limited....	.....	3,529
MARCH 5. By "Surinam," Paramaribo.		
William Schall & Co.....	.....	3,600
MARCH 18. By "Mattura," Port of Spain.		
Various	.....	230
MARCH 19. By "Gen. O. H. Ernst," Cristobal.		
Various	.....	2,100

Custom House Statistics

New York

Imports

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	.....	.....	415,786	$41,447
France	.....	.....	224,082	29,157
Netherlands	100,800	$35,280	2,847,713	535,731
England	636,468	178,011	6,387,143	1,172,919
Nicaragua	.....	.....	7,050	1,061
Argentina	.....	.....	9,576	992
Brazil	2,432,665	310,032	1,994,268	233,470
Colombia	117,568	24,548	101,933	11,706
Ecuador	600	86	27,689	4,142
British India	378,943	108,491	53,760	10,380
Ceylon	.....	.....	5,619,673	864,097
Straits Settlements...	17,471,256	5,607,172	28,420,875	3,956,333
Java	.....	.....	2,244,991	343,711
British East Indies..	1,900,643	398,855	.....	.....
Dutch East Indies...	2,521,287	872,617	3,345,441	550,669
Hongkong	.....	.....	56,000	3,945
Portugal	121,000	13,310	.....	.....
Portuguese Africa ...	150	30	.....	.....
Belgian Congo	60,759	12,267	.....	.....
Dutch Guiana	11,170	6,718	.....	.....
Peru	60,681	11,661	.....	.....
Venezuela	2,335	1,320	.....	.....
Turkey in Asia.....	44,800	13,245	.....	.....
Totals	25,861,125	$7,593,643	51,755,980	$7,809,760

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
UNMANUFACTURED—*free*				
Balata	127,146	80,437	157,253	87,873
Jelutong (Pontianak).....	170,147	20,630	141,779	12,956
Gutta percha	53,327	8,011	.....	.....
Totals	26,211,745	$7,702,721	52,055,012	$7,910,589
Rubber scrap and reclaimed.	148,096	10,224	178,095	7,840
Totals, unmanufactured.	26,359,841	$7,712,945	52,233,107	$7,918,429
Manufactures of rubber and gutta percha .....*dutiable*	.....	$33,045	.....	$63,410
Chicle .....*dutiable*	208,417	$106,520	475,922	$225,296
Rubber substitutes...*dutiable*	.....	.....	4,579	562

Exports

MANUFACTURED				
Automobile and other tires..	.....	$2,010,392	.....	$982,196
Inner tubes	.....	121,227	.....	79,986
Belting, hose, and packing...	.....	825,028	.....	121,565
Rubber boots and shoes.*pairs*	743,507	831,801	47,122	40,836
Soles and heels..	.....	102,890	.....	72,502
Druggists' sundries	.....	150,351	.....	23,783
Other rubber manufactures..	.....	552,314	.....	213,324
Totals, manufactured...	.....	$4,594,003	.....	$1,534,192
Insulated wire	.....	$2,318,553	.....	$132,364
UNMANUFACTURED—*free*				
Rubber scrap and reclaimed.	928,023	$69,638	616,647	$43,515

Foreign Exports

Crude rubber	136,687	$34,372	.....	.....
Balata	.....	.....	103,905	$53,627
Rubber manufactures	.....	32,512	.....	73
Rubber substitutes	.....	53	.....	.....
Gutta percha	36,010	$4,998	.....	.....

Exports of India Rubber Manufactures fro

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Pairs	Soles and Heels Value
EUROPE												
Belgium	$135	.....	$49	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	.....	$1,073	103	.....	12	$50	2,594	$3,161	.....	.....	75	$30
Finland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	3,638	2,207	514	$32,620	16	45	181	211	106	$108	.....	.....
Germany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland, etc., Island	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Italy	.....	2,023	.....	.....	38	166	.....	.....	.....	.....	4	2
Jugoslavia, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malta, etc., Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	30	1,123	.....	.....	.....	.....	.....	.....	504	428	776	320
Norway	48	268	.....	.....	.....	.....	1,766	1,534	.....	.....	.....	.....
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	707	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rumania	.....	92	113	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	.....	.....	.....	.....	132	348	1,001	635	.....	.....	792	338
Sweden	1,675	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,025	489
Switzerland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	2,168	16,341	3,703	49,634	1,863	3,747	3,818	3,306	28,607	21,930	1,873	815
Scotland	3,690	.....	1,132	.....	1	6	.....	.....	19,392	14,197	.....	.....
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$11,384	$23,834	$5,614	$82,254	2,062	$4,362	9,360	$8,847	48,609	$36,663	4,545	$1,994
NORTH AMERICA												
Canada—Maritime Provinces	$1,370	$124	.....	$52	1,238	$4,126	.....	.....	467	$470	742	$500
Quebec and Ontario	1,852	3,862	$2,086	329	203	656	90	$126	2,410	3,534	733	453
Prairie Provinces	22	882	238	83	.....	.....	81	245	1,006	1,008	.....	.....
British Columbia and Yukon	776	583	320	.....	823	3,495	118	310	.....	.....	.....	.....
British Honduras	.....	171	27	.....	.....	.....	484	540	972	1,070	.....	.....
Costa Rica	418	720	67	.....	.....	.....	.....	.....	175	118	3,119	1,813
Guatemala	480	.....	.....	.....	.....	.....	.....	.....	.....	.....	437	247
Honduras	167	195	410	.....	.....	.....	192	223	867	1,344	1,964	1,693
Nicaragua	1,428	202	.....	.....	.....	.....	36	35	266	302	401	292
Panama	58	1,956	122	.....	.....	.....	72	61	1,236	1,140	271	92
Salvador	.....	.....	.....	97	.....	.....	.....	.....	.....	.....	4,159	4,311
Mexico	13,958	16,850	5,991	563	75	395	5,038	5,807	15,977	14,492	15,947	7,554
Miquelon, etc.	.....	.....	.....	.....	181	553	72	41	.....	.....	.....	.....
Newfoundland and Labrador	10	34	.....	.....	290	852	7,410	2,403	.....	.....	869	439
Bermuda	.....	.....	50	.....	29	63	88	59	644	979	745	394
Barbados	.....	.....	.....	.....	.....	.....	.....	.....	10	15	.....	.....
Jamaica	.....	235	170	.....	.....	.....	263	294	2,048	1,628	.....	.....
Trinidad and Tobago	30	86	321	.....	.....	.....	134	173	972	1,039	.....	.....
Other British West Indies	.....	6	18	.....	.....	.....	.....	.....	879	821	18	13
Cuba	1,795	3,851	2,141	.....	.....	.....	2,568	2,512	580	525	7,119	3,411
Dominican Republic	110	246	630	.....	.....	.....	384	401	376	373	1,557	773
Dutch West Indies	.....	.....	.....	.....	.....	.....	24	23	1,034	892	268	127
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haiti	.....	78	.....	.....	.....	.....	.....	.....	48	58	.....	.....
Virgin Islands of United States	28	.....	.....	.....	.....	.....	.....	.....	1,002	1,303	328	151
TOTALS, NORTH AMERICA	$22,502	$30,081	$12,591	$1,124	2,839	$10,148	17,054	$13,253	30,969	$31,111	38,677	$22,263
SOUTH AMERICA												
Argentina	$410	$1,841	$115	.....	.....	.....	7,700	$5,933	.....	.....	5,881	$3,351
Bolivia	1,130	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil	1,932	6,476	35	.....	.....	.....	.....	.....	.....	.....	4,799	1,463
Chile	1,853	.....	67	.....	.....	.....	1,748	1,136	.....	.....	.....	.....
Colombia	.....	984	999	.....	.....	.....	.....	.....	1,845	$2,027	7,189	3,266
Ecuador	.....	1,343	60	.....	.....	.....	.....	.....	728	597	.....	.....
British Guiana	.....	47	.....	.....	.....	.....	.....	.....	600	536	.....	.....
Dutch Guiana	163	19	16	.....	.....	.....	.....	.....	.....	.....	.....	.....
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	.....	135	389	.....	.....	.....	.....	.....	.....	.....	.....	.....
Uruguay	.....	.....	.....	.....	.....	.....	.....	.....	792	700	424	300
Venezuela	.....	382	1,448	.....	36	$103	96	111	.....	.....	2,258	1,029
TOTALS, SOUTH AMERICA	$5,488	$11,227	$3,129	.....	36	$103	9,544	$7,180	3,965	$3,860	20,551	$9,409
OCEANIA												
Philippine Islands	$784	$1,596	$1,815	.....	72	$163	3,000	$2,072	21,977	$15,239	2,282	$772
Australia	6,697	783	2,849	.....	74	360	336	355	.....	.....	.....	.....
British Oceania	.....	.....	.....	.....	.....	.....	500	642	13	25	.....	.....
New Zealand	63	.....	155	.....	.....	.....	.....	.....	.....	.....	976	425
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	121	236	.....	.....
TOTALS, OCEANIA	$7,544	$2,379	$4,819	.....	146	$523	3,836	$3,069	22,111	$15,500	3,258	$1,197
ASIA												
British India	$1,640	$1,622	$14	.....	.....	.....	.....	.....	420	$483	.....	.....
Straits Settlements	889	96	.....	.....	.....	.....	.....	.....	48	83	.....	.....
China	6,329	723	838	$340	.....	.....	2,203	$2,059	1,368	1,150	.....	.....
Chosen	.....	.....	86	.....	.....	.....	816	711	.....	.....	.....	.....
Java and Madura	322	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Far Eastern Republic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
French Indo China	.....	38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Dutch East Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	.....	858	.....	.....	.....	.....	168	193	.....	.....	.....	.....
Japan	2,267	1,454	1,388	18,300	972	$2,598	11,208	11,312	1,320	1,295	.....	.....
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500	$269
Persia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Siam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, ASIA	$11,447	$4,791	$2,326	$18,640	972	$2,598	14,395	$14,275	3,156	$3,011	500	$269

fro[illegible]nited States by Countries During January, 1922

Pneumatic Castings			Solid Tires		Pneumatic Tubes					Hard Rubber Goods				
Automobile					Automobile									
Number	Value	Others Value	Automobile Value	Others Value	Number	Value	Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value	All Other Rubber Manufactures Value	Totals Value
									$300				$585	$2,574
100	$1,505								357		$52	$3,014	1,161	41,416
915	24,818		$3,060		1,296	$4,537							275	275
													8,539	63,328
820	10,669	$21	355		614	2,537		$192	1,672					143
			143											3,996
236	3,175		150		263	601		70						474
30	345				10	75		54					411	3,257
12	110				10	66			479					1,024
28	688				85	186			150					528
12	419				12	34					75			8,019
168	2,802			$486	23	75		15	620				2,120	8,221
172	5,055		1,102		36	142							72	36,738
			36,738											721
					3	14								1,493
									932			268	88	26,630
					939	1,912			173				2,131	34,576
1,355	18,796		2,297		1,223	2,578		1,481					307	3,445
1,548	27,914	132											3,445	3,024
					258	427								487,439
116	1,487		1,110		1,922	5,112	$74	14	11,512			6,567	29,237	21,034
24,812	321,848	399	11,032		5	11							1,426	2,112
120	572								360			1,728	24	
30,344	$420,203	$552	$55,987	$486	5,699	$18,307	$74	$1,826	$16,555		$127	$11,577	$49,821	$750,467
									$69		$178	$26	$2,229	$9,199
2	$12	$4	$39					$1,143	12,057		1,111	7,865	58,017	225,059
7,583	97,512	71	13,584	$771	12,439	$20,030		465	1,394	$439	121	370	3,093	9,740
45	479		692	5	33	204			207			34	2,789	9,655
24	569	99	444		5	19	$7		64					2,411
25	242	148			38	85	59	5	28	58			537	5,106
55	1,258				32	85		738					69	22,899
688	20,201		407		265	757			104		41	43	166	5,719
54	1,036	12			56	285		3	5				31	3,143
34	734				55	111		120	181			187	1,891	18,591
692	10,984	84	383		1,121	1,332							325	13,628
486	8,414		287		51	194		350	2,298			486	13,504	139,475
1,993	42,730	589	643	853	4,080	12,346	66							594
									19				564	4,331
1	10								634			51	70	2,944
				639							25		265	1,131
44	662				32	164					32		932	16,703
778	10,701		1,250	191	542	1,020		232	18		16	5	698	22,413
559	8,570		9,478		806	1,760		200	37				356	2,420
33	489	77	242	115	56	275			8		174	176	4,008	122,302
4,971	74,342	851	16,374	1,102	3,077	7,045	470	735	2,790		2		778	16,063
755	8,714	143	316	1,249	876	2,046		7	275			61	91	2,864
124	1,491				88	138			41					2,248
175	2,151		44		32	53							76	5,134
272	3,458	48	98	152	500	965	44	130	27					2,553
42	683				34	78		87	223					
19,435	$295,442	$2,126	$44,281	$5,077	24,208	$48,992	$646	$4,219	$20,479	$497	$1,700	$9,304	$90,489	$666,325
													$2,257	$98,561
6,528	$70,357		$711	$1,167	6,727	$10,786		$587	$676	$370				3,482
78	1,876				145	476							300	34,542
1,688	22,076		402		332	1,246			262		$350		345	13,657
672	9,823		284	28	32	100		21					1,173	17,497
489	7,300	$29	323	2	238	620	$200	22	273		279		50	3,536
41	787				270	699			180				309	1,942
74	776				20	58					36		5	1,140
50	787				56	144		6	21					21
											339	$531	268	15,819
706	13,298		190	53	250	616		1,071					380	16,765
1,288	13,101				860	1,213			166		14		1,356	24,769
1,118	17,287	690		113	981	2,070								
12,732	$157,468	$719	$1,910	$1,363	9,911	$18,028	$200	$1,707	$1,578	$370	$1,018	$531	$6,443	$231,731
													$9,795	$91,500
2,426	$36,836	$404	$2,997		2,787	$16,273	$194	$1,275	$951	$190	$144		5,814	54,891
1,788	29,406		1,339	$1,102	737	4,907		252	266	356	206	$199		667
													1,163	63,832
3,363	46,757	722	13,839		132	306		52	350			8		696
24	365	56						31						
7,601	$113,364	$1,182	$18,175	$1,102	3,656	$21,486	$194	$1,610	$1,567	$546	$358	$199	$16,772	$211,586
													$323	$20,728
					104	$192	$20	$269	$101				40	24,753
530	$7,469	$282	$8,285	$28	955	1,308		20	12				3,702	17,530
897	9,472		12,833		5	25	14		1,095					797
73	1,255												80	14,952
					1,178	2,546								960
1,072	10,920		1,084		50	150								38
60	810													193
														1,643
24	193				300	571							1,587	2,638
120	1,072										590	2,614	13,676	74,545
					60	145		45					12	9,541
1,030	15,255		3,431	175	209	521	10	10						52
1,160	8,719				20	52							94	2,014
					10	10								
83	1,910													
5,049	$57,075	$282	$25,633	$203	2,891	$5,520	$44	$344	$1,208		$590	$2,614	$19,514	$170,384

Exports of India Rubber Manufactures from the

	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Pairs	Soles and Heels Value
AFRICA												
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British South Africa	$13,114	$898	$847	.....	.....	.....	198	$149	424	$252	2,801	$1,699
British East Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	18	31	.....	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Algeria and Tunis	8,131	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liberia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Portuguese Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$21,245	$898	$847	.....	.....	.....	198	$149	442	$283	2,801	$1,699
GRAND TOTALS	$79,610	$73,210	$29,326	$102,018	6,055	$17,734	54,387	$46,773	109,252	$90,428	70,332	$36,831

Exports of Rubber Goods to Non-

	Belting Value
Alaska	$592
Hawaii	7,454
Porto Rico	1,989
TOTALS	$10,035

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
UNMANUFACTURED—*free*				
India rubber				
From France	.....	.....	224,082	$29,157
Netherlands	100,800	$35,280	2,847,713	535,731
Portugal	121,000	13,310	.....	.....
United Kingdom	636,468	178,011	6,387,143	1,172,919
Canada	.....	.....	4,645	764
Central America	.....	.....	7,050	1,061
Brazil	2,432,665	310,032	1,994,268	283,470
Peru	60,681	11,661	.....	.....
Other South America	131,673	32,672	139,198	16,840
British East Indies	20,750,200	6,423,676	36,300,528	5,126,274
Dutch East Indies	2,617,357	905,494	5,634,533	899,304
Other countries	60,909	12,297	471,786	45,392
Totals	26,911,753	$7,922,433	54,010,946	$8,110,912
Balata	127,146	$80,437	157,253	$87,878
Jelutong (Pontianak)	170,147	20,630	141,779	12,956
Gutta percha	53,327	8,011	.....	.....
Rubber scrap	165,176	10,417	578,236	18,583
Totals, unmanufactured	27,427,549	$8,041,928	54,888,214	$8,230,329
Chicle ..... *dutiable*	818,277	$428,922	899,089	$423,855
MANUFACTURED—*dutiable*				
India rubber and gutta percha	.....	44,918	.....	129,321
India rubber substitutes	.....	.....	4,579	562

Exports of Domestic Merchandise

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
MANUFACTURED				
India rubber				
Reclaimed	118,828	$20,840	149,423	$15,472
Scrap and old	952,265	66,568	814,009	48,012
Footwear				
Boots[1] ..... *pairs*	24,122	81,441	6,055	17,734
Shoes[1] ..... *pairs*	957,122	968,550	54,387	46,773
Canvas shoes with rubber soles[1]	.....	.....	109,252	90,428
Druggists' rubber sundries[1]	.....	187,664	34,621	41,391
Hard rubber goods				
Battery jars and accessories[1]	.....	.....	5,576	1,413
Other electrical supplies[1]	.....	.....	10,227	3,793
Other hard rubber goods[1]	.....	.....	34,590	24,225
Tires				
Pneumatic casings				
For automobiles[1]	.....	2,045,877	80,511	1,148,616
Other[1]	.....	.....	1,577	4,875
Pneumatic tubes				
For automobiles[1]	.....	157,972	48,935	116,385
Other[1]	.....	.....	1,134	1,153
Solid tires				
For automobiles and motor trucks[1]	.....	194,417	3,890	147,601
Other[1]	.....	.....	22,610	8,231
All other tires[1]	.....	76,833	.....	.....
Tire repair materials[1]	.....	.....	22,340	10,293
Belting[1]	.....	289,707	151,006	79,610
Hose[1]	.....	510,155	175,073	73,210
Packing[1]	.....	146,112	55,482	29,326
Soles and heels[1]	.....	108,205	70,332	36,831
Thread[1]	.....	.....	80,492	102,018
Other rubber manufactures[1]	.....	713,675	324,915	183,862
Totals, manufactured	1,952,337	$5,568,016	2,256,437	$2,231,257

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
MANUFACTURED				
Fountain pens ..... *number*	45,197	$68,749	1,455	$1,379
Insulated wire and cables	.....	.....	513,483	80,618

Exports of Foreign Merchandise

UNMANUFACTURED				
India rubber	1,186,945	$239,744	1,174,093	$219,519
Balata	.....	.....	103,905	53,627
Totals, unmanufactured	1,186,945	$239,744	1,278,898	$273,146
MANUFACTURED				
Gutta percha and india rubber	.....	$32,512	.....	$223
India rubber substitutes	.....	53	.....	150
Totals, unmanufactured	.....	$32,565	.....	$373

[1]Details of exports of domestic merchandise by countries during January, 1922, appear in this issue.

Imports of Crude Rubber into the United States by Customs Districts

CUSTOMS DISTRICTS	January, 1922 Pounds	January, 1922 Value	February, 1922 Pounds	February, 1922 Value
Massachusetts	361,620	$40,896	371,419	$47,427
Buffalo	4,645	764	11,716	1,732
New York	51,755,980	7,809,760	65,700,447	10,660,885
El Paso	.....	.....	121,000	24,200
Los Angeles	1,788,600	248,217	312,100	64,064
San Francisco	100,101	11,185	126,042	13,550
Colorado	.....	.....	101,516	15,248
Totals	54,010,946	$8,110,912	66,744,240	$10,827,106

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	December 1920 Pounds	December 1920 Value	December 1921 Pounds	December 1921 Value
UNMANUFACTURED—*free*				
Rubber, gutta-percha, etc.				
From United Kingdom	151,726	$40,850	70,762	$10,901
United States	1,040,464	179,121	923,970	188,809
Brazil	46,090	11,943	.....	.....
British East Indies				
Straits Settlements	1,050,258	324,265	267,939	38,602
Dutch East Indies	22,129	10,933	.....	.....
France	22,566	8,711	.....	.....
Other countries	180	36	.....	.....
Totals	2,333,413	$575,859	1,262,671	$238,312
Rubber recovered	25,584	5,107	178,565	21,821
Rubber, powdered and rubber or gutta percha scrap	157,764	17,351	173,875	10,386
Rubber substitutes	127,873	17,605	9,416	2,419
Totals, unmanufactured	2,644,634	$615,922	1,624,527	$272,938

United States by Countries During January, 1922—*Continued*

Automobile Number	Automobile Value	Automobile Others Value	Solid Tires Automobile Value	Solid Tires Others Value	Pneumatic Tubes Automobile Number	Pneumatic Tubes Automobile Value	Pneumatic Tubes Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods Battery Jars and Accessories Value	Hard Rubber Goods Other Electrical Supplies Value	Hard Rubber Goods Others Value	All Other Rubber Manufactures Value	Totals Value
753	$21,690	$14	$889	.....	844	$2,742	.....	.....	.....	.....	.....	.....	.....	$25,335
4,209	79,638	.....	.....	.....	116	359	.....	$355	$4	.....	.....	.....	$688	98,003
98	1,162	.....	.....	.....	161	330	.....	.....	.....	.....	.....	.....	.....	1,492
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31
188	2,277	.....	726	.....	449	621	.....	220	.....	.....	.....	.....	.....	3,844
2	297	.....	.....	.....	.....	.....	.....	12	.....	.....	.....	.....	.....	8,440
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	15
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	120	120
5,250	$105,064	$14	$1,615	.....	1,570	$4,052	.....	$587	$4	.....	.....	.....	$823	$137,280
80,511	$1,148,616	$4,875	$147,601	$8,231	48,935	$116,385	$1,158	$10,293	$41,391	$1,413	$3,793	$24,225	$183,862	$2,167,773

Contiguous Territories of the United States

Tires Automobile Value	Tires All Others Value	All Other Rubber Manufactures Value	Totals Value
$371	.....	$5,981	$6,944
86,437	$373	12,488	106,752
79,380	46	23,518	104,933
$166,188	$419	$41,987	$218,629

Rubber Statistics from the Dominion of Canada—*Cont.*

	December 1920 Pounds	December 1920 Value	December 1921 Pounds	December 1921 Value
PARTLY MANUFACTURED				
Hard rubber sheets and rods	1,328	$710	436	$569
Hard rubber tubes	.....	4,112	.....	2,739
Rubber thread, not covered	563	838	8,473	9,957
Totals, partly manufactured	1,891	$5,660	8,909	$13,265
MANUFACTURED				
Belting	.....	$16,432	.....	$5,064
Hose	.....	12,679	.....	8,934
Packing	.....	5,015	.....	4,508
Boots and shoes	.....	9,652	.....	7,767
Clothing, including waterproofed	.....	21,479	.....	5,904
Gloves	.....	1,265	.....	799
Hot-water bottles	.....	1,977	.....	890
Tires, solid	.....	8,951	.....	6,176
Tires, pneumatic	.....	162,484	.....	57,365
Inner tubes	.....	15,976	.....	8,747
Elastic, round or flat	.....	24,703	.....	21,854
Mats and matting	.....	58	.....	499
Cement	.....	4,777	.....	5,282
Other rubber manufactures	.....	98,919	.....	81,377
Totals, manufactured	.....	$384,367	.....	$215,166
Totals, rubber imports	2,646,525	$1,005,949	1,633,436	$501,369
Insulated wire and cables				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$21,282	.....	$5,507
Copper wire and cables covered as above	.....	8,905	.....	18,663
Chicle	$44,924	20,429	$82,925	39,406
Fillets	.....	.....	.....	444
Webbing	.....	10,063	.....	29,070
Fountain pens	.....	3,771	.....	4,731

Exports of Domestic and Foreign Rubber Goods

	December 1920 Produce of Canada Value	December 1920 Reexports of Foreign Goods Value	December 1921 Produce of Canada Value	December 1921 Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$2,256	.....	$8,571	$608
MANUFACTURED				
Belting	5,155	.....	5,045	.....
Hose	31,513	.....	8,881	.....
Boots and shoes	291,851	.....	76,230	429
Clothing, including waterproofed	3,657	$254	673	334
Tires, pneumatic	665,433	.....	283,882	.....
Tires	13,072	25	8,072	6,442
Other manufactures	65,187	4,800	31,855	1,282
Totals, manufactured	$1,075,868	$5,079	$414,640	$8,487
Totals, rubber exports	$1,078,124	$5,079	$423,211	$9,095

United Kingdom Rubber Statistics

Imports

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	8,252,700	£481,247	3,205,700	£128,764
Federated Malay States	7,710,500	445,846	5,895,200	279,538
British India	800,300	43,715	995,400	45,352
Ceylon and dependencies	3,379,200	179,580	2,298,900	107,556
Other Dutch possessions in Indian Seas	1,227,800	73,595	566,500	26,359
Dutch East Indies (except other Dutch possessions in Indian Seas)	1,481,000	82,869	515,000	22,443
Other countries in East Indies and Pacific not elsewhere specified	295,300	14,954	221,200	10,862
Brazil	693,400	32,668	696,300	36,383
Peru	7,200	362	.....	.....
South and Central America (Except Brazil and Peru)	13,300	676	9,300	370
West Africa:				
French West Africa	.....	.....	9,800	328
Gold Coast	7,600	386	.....	.....
Other parts of West Africa	57,000	2,631	39,500	1,448
East Africa (including Madagascar)	70,700	3,124	59,500	2,182
Other countries	131,800	6,582	93,000	2,483
Totals	24,128,000	£1,368,235	14,605,300	£664,068
Waste and reclaimed rubber	328,900	£5,281	53,400	£706
Gutta percha and balata	1,050,800	195,312	907,400	147,206
Rubber substitutes	43,700	1,187	13,200	280
Totals, unmanufactured	25,551,400	£1,570,015	15,579,300	£812,260
MANUFACTURED				
Boots and shoes..*dozen pairs*	7,231	£22,712	6,568	£15,341
Waterproof clothing	.....	40	.....	209
Insulated wire	.....	2,478	.....	4,607
Tires and tubes	.....	309,122	.....	241,803
Other rubber manufactures	.....	66,309	.....	59,718
Totals, manufactured	.....	£400,661	.....	£321,678

Exports

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
UNMANUFACTURED				
Waste and reclaimed rubber	610,700	£16,513	686,500	£10,924
Rubber substitutes	54,100	1,985	53,200	1,451
Totals, unmanufactured	664,800	£18,498	739,700	£12,375
MANUFACTURED				
Boots and shoes..*dozen pairs*	17,744	£43,316	6,604	£14,065
Waterproof clothing	.....	94,053	.....	59,138
Insulated wire	.....	185,307	.....	56,120
Submarine cables	.....	93,498	.....	3,393
Tires and tubes	.....	351,672	.....	149,849
Other rubber manufactures	.....	360,584	.....	216,030
Totals, manufactured	.....	£1,128,430	.....	£498,595

United Kingdom Rubber Statistics—*Continued*

Exports—Colonial and Foreign

	January 1921 Pounds	January 1921 Value	January 1922 Pounds	January 1922 Value
UNMANUFACTURED				
Crude rubber				
To Sweden, Norway and Denmark	360,300	£21,217	28,800	£1,306
Germany	880,500	44,549	1,682,400	70,215
Belgium	254,200	14,452	210,000	9,230
France	547,000	32,923	3,627,200	161,528
Spain	16,500	922	104,400	4,814
Italy	357,800	16,204	420,500	19,895
Austria	29,700	1,666	45,500	2,050
Hungary	.....	.....	2,700	112
Other European countries	185,700	12,064	145,500	6,450
United States	398,600	46,315	12,678,000	558,842
Canada	23,500	700	86,400	4,370
Other countries	27,800	1,644	2,400	117
Totals	3,081,600	£192,655	19,033,800	£838,929
Waste and reclaimed rubber	900	35	.....	.....
Gutta percha and balata	15,700	3,656	73,200	11,402
Rubber substitutes	.....	.....	2,400	69
Totals, unmanufactured	3,098,200	£196,346	19,109,400	£850,400
MANUFACTURED				
Boots and shoes..*dozen pairs*	578	2,885	916	2,386
Waterproof clothing	.....	.....	.....	25
Insulated wire	.....	.....	.....	69
Tires and tubes	.....	67,541	.....	53,180
Other rubber manufactures	.....	2,281	.....	4,391
Totals, manufactured	.....	£72,707	.....	£60,051

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The downward swing of middlings spot New York prices started from January 1 and reached a low of 16.45 cents on January 31, when an irregular upward trend began which mounted to 18.80 cents on February 27. For the past month the movement has averaged downward, with only two pronounced declines of two days' duration, the net decline for the monthly interval reported being 35 points.

In case domestic consumption and exports from March 1 for the remainder of the year equal those of last year it will mean a total home consumption and export of 12,339,000 bales for the season compared with the crop of about 9,000,000 bales, including linters and imports.

EGYPTIAN COTTON. The Egyptian market has been dull and quiet for some weeks. Uppers apparently have stabilized temporarily around 26 cents for medium grade and 33 cents for medium Sakellarides. Fluctuations above or below these points have been extremely narrow.

American and English demand has not been in sufficient volume to have much effect on values.

The Egyptian Government has decided to give its support again to cotton by buying limited quantities principally from small farmers in need of cash. This method was adopted less than a year ago and was shortly followed by considerably higher prices caused almost entirely by a good demand from spinners.

There has been formed in Cairo, recently, a growers' pool to take up about 500,000 cantars, or 50,000,000 pounds, of cotton to be held for higher prices. This supporting agency may never become operative, but should this market show signs of weakness the government may lend its support to insure approximately the present values for some time to come. A marked revival of spinning demand would mean much higher prices.

ARIZONA COTTON. This grade is selling in a very limited way. Prices have remained fairly steady with medium grades quoted at 32 cents.

SEA ISLAND COTTON. Sea Island cotton has been in extremely limited demand with sales of extra choice at 42 cents.

DRILLS, DUCKS AND OSNABURGS. The market has been quiet, but the outlook is encouraging as there will probably be a shortage of these materials before summer arrives.

RAINCOAT CLOTHS. The consumption of raincoat cloth is at low ebb. Spring activity has not yet reached normal proportions and clothing manufacturers are confining their purchases of supplies to small lots for current needs.

SHEETINGS. Buying has again dropped down to very small lots. A few numbers in sheeting for export are moving fairly well but there seems to be little or no encouragement for buyers to take sheetings in good size lots. The market is in a drifting condition.

TIRE FABRICS. The call for tire fabrics on the part of manufacturers is not active. Textile strikes and tariff uncertainties continue to be disturbing factors affecting prices.

New York Quotations

March 25, 1922

Prices subject to change without notice

Burlaps

3o—8-ounce	100 *yds.*	$4.20	@$4.25
40—7-ounce		4.05	@ 4.10
40—7½-ounce		4.25	@ 4.30
40—8-ounce		4.25	@ 4.30
40—10-ounce		5.70	@ 5.75
40—10½-ounce		5.65	@ 5.70

Drills

38-inch 2.00-yard	*yard*	.16½ @
40-inch 3.47-yard		.10⅛ @
52-inch 1.90-yard		.18 @
60-inch 1.52-yard		.22⅛ @

Duck

CARRIAGE CLOTH

38-inch 2.00-yard enameling duck	*yard*	.17½ @
40-inch 1.47-yard		.23⅞ @
72-inch 16.66-ounce		.39½ @
72-inch 17.21-ounce		.40⅞ @

MECHANICAL

Hose	*pound*	.32 @
Belting		.31 @

Osnaburgs

40-inch 2.35-yard		.14 @
40-inch 2.48-yard		.13½ @
37½-inch 2.42-yard		.13⅝ @

Hollands, 40-inch

DEAD FINISH

Standard, 36-inch, white	.18	@
36-inch, colors	.18	@
42-inch, white	.22	@
42-inch, colors	.22	@

FLAT FINISH

Imperial, 36-inch, white	.14	@
36-inch, colors	.14	@
42-inch, white	.17	@
42-inch, colors	.17	@

Raincoat Fabrics

COTTON

Bombazine 64 x 60 *yard*	.11¼	@	
60 x 48	.10¾	@	
Cashmeres, cotton and wool, 36-inch, tan	.50	@	
Twills 64 x 72		@	
60 x 102		@	
Twill, mercerized, 36-inch, blue and black		@	
tan and olive		@	
Tweed	.20	@	1.00
printed	.15	@	
Plaids 60 x 48	.11¼	@	
56 x 44	.10¾	@	
Repp		@	
Prints 60 x 48	.12	@	
64 x 60	.13	@	

Sheetings, 40-inch

48 x 48, 2.50-yard *yard*	.12¼	@
48 x 48, 2.85-yard	.11	@
64 x 68, 3.15-yard	.12¼	@
56 x 60, 3.60-yard	.10	@
48 x 44, 3.75-yard	.10	@

Silks

Canton, 38-inch *yard*	.29½	@
Schappe, 36-inch	.45	@

Stockinettes

SINGLE THREAD

3½ Peeler, carded *pound*		@
4½ Peeler, carded		@
6½ Peeler, combed		@

DOUBLE THREAD			
Zero Peeler, carded	pound	@	
3½ Peeler, carded		@	
6½ Peeler, combed		@	
Tire Fabrics			
BUILDING			
17½-ounce Sakellarides, combed	pound	$0.90	@
17½-ounce Egyptian, combed		.70	@$0.75
17½-ounce Egyptian, carded		.68	@ .70
17½-ounce Peelers, combed		.72	@ .75
17½-ounce Peelers, carded		.55	@
CORD			
15-ounce Egyptian	pound	.75	@ .80
BICYCLE			
8-ounce American	pound		@
10-ounce American			@
CHAFER			
9½-ounce Sea Island	pound		@
9¼-ounce Egyptian, carded		.75	@ .78
9¼-ounce Peeler, carded		.63	@ .65

The Market for Chemicals and Compounding Ingredients

New York

Approximately one-half of the list of chemicals and compounding ingredients used in the rubber goods manufacturing industry shows fair to good and increasing demand. There has been very little tendency to lower prices, since extremely low levels in all lines have prevailed for months. Tires, heels, and such seasonable lines as hose and jar-ring production are the most active rubber manufacturing lines at present and are absorbing a very fair tonnage of lithopone, zinc oxide and a variety of inert compounding fillers. The outlook for greater demand from producers of other lines of rubber goods is slowly increasing as spring trade gains in volume.

ANILINE. Trade picked up notably the past month and demand advanced to very fair proportions, stimulated somewhat by a reduction in price after the middle of the month.

ANTIMONY SULPHIDES. The demand has been light despite the very low prices. There is an excess of supply which price reduction cannot move in the absence of rubber-makers' lack of need for the material.

BARYTES. This stock has experienced considerable activity and prices have firmed up somewhat. There has been no stocking up.

BENZOL. Trade is in good seasonal condition. Prices have been revised upward. Domestic requirements utilize practically all stocks, leaving little for export.

BLANC FIXE. Trade conditions are reported improving and the outlook good.

CARBON BISULPHIDE. This material has been in routine movement only with prices steady at 6 to 7 cents per pound.

CARBON TETRACHLORIDE. Supplies are in large volume. Trade has been quiet the entire month.

CHINA CLAY. Imports are not in large volume. Business is good for the season and indications point to an increase in consumption for this year over last.

DRY COLORS. Interest in the dry color list is rather inactive. The number of dry colors utilized in the rubber industry is not extensive, being confined principally to certain mechanical lines not at present in active production.

GAS BLACK. Satisfactory business is reported in progress. The tire trade is the largest consumer in the rubber industry and the outlook in that line bids fair for continuance of a good demand for blacks.

LITHARGE. The situation from the rubber-makers' point of view has not changed materially during March. Stocks are not being purchased in advance of present needs, notwithstanding the low quotations.

LITHOFONE. This is the only item on the list that shows satisfactory activity. This is due more to the condition of the paint trade than to that in tires. The former consumes two-thirds of the lithopone produced. Tire manufacturers are accounting for a steadily increasing tonnage of lithopone as the spring output of tires develops toward normal. The price holds steadily at the low level which has prevailed for months.

SOLVENT NAPHTHA. This material is in short supply, also the demand has dropped off in marked degree.

SUBLIMED LEAD. The situation is in all respects similar to that prevailing with litharge. A gradual improvement is noted with prices steady.

SULPHUR. A steady market both as to prices and stock for consumption continues to prevail.

SULPHUR CHLORIDE. The market is dull at 5 to 6 cents quoted. Supplies are largely in excess of current requirements.

TALC. Imports have been small in volume and foreign and domestic grades are in good request.

WHITING. Prices and business have run through the month without notable change. The demand has essentially been routine only.

ZINC OXIDE. The tire industry is a large buyer and will doubtless call for more material this year than last, and is reported to be buying in good volume for spring needs. The trade in zinc oxide is experiencing encouraging improvement.

TIRE
FABRICS

JENCKES
SPINNING
COMPANY

PAWTUCKET
RHODE ISLAND

AKRON OFFICE
Second National Building

NEW YORK OFFICE
Fisk Building,
Broadway at 57th Street

New York Quotations

March 25, 1922

Prices subject to change without notice

Accelerators, Organic

Accelerene (f. o. b. English port)	lb.	13s.	@
Adco	lb.	$0.75	@
Aldehyde ammonia crystals	lb.	.90	@ .95
Aniline (f. o. b.) factory	lb.	.16½	@ .20
Diphenyl-guanidine	lb.	1.50	@
Ethylidene aniline	lb.	.75	@ .80
Excellerex	lb.	.50	@ .60
Formaldehyde aniline	lb.	.45	@ .50
Hexamethylene tetramine	lb.	.72½	@ .75
Lead oleate	lb.	.18½	@ .26
Methylene aniline	lb.	.38	@ .40
No. 999	lb.	.13½	@
Paradin	lb.	.38	@
Paraphenylene diamine	lb.	1.60	@ 1.75
Speed-X	lb.	1.50	@
Super-Sulphur, No. 1	lb.	.50	@ .60
No. 2	lb.	.25	@ .30
Thiocarbanilide	lb.	.33	@ .50
Vul-Ko-Cene	lb.	.35	@
XLO	lb.	1.30	@

Accelerators, Inorganic

Lead, dry red	lb.	.08	@ .08¼
white, basic carbonate	lb.	.06½	@ .07½
Lime, flour, superfine	lb.	.02½	@
Litharge, domestic	lb.	*.08½	@
imported	lb.	*.17	@
Orange, mineral	lb.	.11	@ .13
Magnesium, carbonate, light, (bags)	lb.	.05¼	@
calcined, light (bbls.)	lb.	.24	@ .25
calcined, ex. light (bbls.)	lb.	.45	@
calcined, md. light (bbls.)	lb.	.20	@
calcined, heavy (bbls.)	lb.	.05½	@ .06

Acids

Acetic 28% (bbls.)	cwt.	2.50	@ 3.00
glacial, 99%	cwt.	8.50	@10.00
Cresylic (97% straw color)	gal.	.50	@ .52
(95% dark)	gal.	.45	@ .47
Muriatic, 20 degrees	cwt.	1.25	@ 1.50
Nitric, 36 degrees	cwt.	5.00	@ 6.00
Sulphuric, 66 degrees	ton	16.00	@17.00

Alkalies

Caustic soda	cwt.	3.50	@ 3.60
Soda ash, 58% (bbls.)	cwt.	1.90	@ 2.00

Colors

BLACK			
Bone, powdered	lb.	.05½	@ .07½
Carbon black	lb.	.11½	@
pressed	lb.	.11½	@
Dipped goods	lb.	1.00	@
Drop	lb.	.07½	@ .16
Ivory black	lb.	.15	@ .45
Lampblack	lb.	.17	@ .45
Micronex	lb.	.12	@ .17
Oil-soluble aniline	lb.	.90	@
Rubber maker's black (non-flying)	lb.	.40	@
BLUE			
Cobalt	lb.	.23	@ .30
Dipped goods	lb.	1.00	@
Prussian	lb.	.50	@
Rubber makers' blue	lb.	3.50	@
Ultramarine	lb.	.10	@ .35
BROWN			
Iron oxide	lb.	.04	@ .05
Sienna, Italian, raw and burnt	lb.	.05½	@ .07
Umber, Turkey, raw and burnt	lb.	.05	@ .06¼
Vandyke	lb.	.06	@ .$6½
GREEN			
Chrome, light	lb.	.30	@ .32
medium	lb.	.35	@ .36
dark	lb.	.36	@ .45
commercial	lb.	.12	@
tile	lb.	.11	@ .13
Guignet	lb.	1.50	@
Dipped goods	lb.	1.00	@
Oxide of chromium	lb.	.45	@ .57
Rubber makers' green	lb.	3.50	@
RED			
Antimony, crimson	lb.	.37	@ .44
crimson, 15/17%, sulphur free	lb.	.38	@ .47
crimson, F.	lb.	.35	@
crimson, R. M. P. reg. No. 3	lb.	.48	@
Antimony, golden	lb.	.18½	@ .27
golden, R. M. P. reg. No. 7	lb.	.20	@
golden 1	lb.	.30	@
golden 2	lb.	.25	@
golden, 15/17%, sulphur free	lb.	.21	@
7-A	lb	.35	@
vermilion	lb.	.50	@
red sulphuret	lb.	.20	@
Arsenic, red sulphide	lb.	.12	@
Cadmium, sulphide	lb.	1.50	@ 1.75
Dipped goods, red	lb.	1.00	@
purple	lb.	1.00	@
orange	lb.	1.00	@
Indian	lb.	.08	@ .12
Indian maroon, English	lb.	.12	@ .15
Iron oxide, reduced grades	lb.	.12	@
pure bright	lb.	.14	@
Maroon oxide	lb.	.08	@ .12
Red oxide, crimson	lb.	.05½	@
English	lb.	.14	@
Spanish	lb.	.04½	@
Oil-soluble aniline, red	lb.	1.70	@ 1.95
orange	lb.	1.45	@
Oximony	lb.	.16	@
Para toner	lb.	1.40	@
Rubber makers' red (four shades)	lb.	3.50	@
purple	lb.	2.50	@
Spanish natural	lb.	.03½	@ .04½
Toluidine toner	lb.	2.50	@
Venetian	lb.	.03½	@ .06½
Vermilion, American	lb.	.25	@ .30
English quicksilver	lb.	.85	@ .90
WHITE			
Albalith	lb.	.06	@ .06½
Aluminum bronze	lb.	.55	@ .60
Lithopone, domestic (factory)	lb.	.06	@ .06½
Zinc oxide:			
American Horse Head (factory):			
Special	lb.	.08	@ .08½
XX red	lb.	.07½	@ .08
French process, Florence brand (factory):			
White seal	lb.	.11	@ .11¼
Green seal	lb.	.09¼	@ .10¼
Red seal	lb.	.08¾	@ .09¼
Azo (factory):			
ZZZ (lead free)	lb.	.07½	@ .08
ZZ (under 5%) leaded	lb.	.07¼	@ .07¾
(8% leaded)	lb.	.07	@ .07½
YELLOW			
Cadmium, sulpride, light	lb.	1.85	@
Chrome, light and med.	lb.	.16½	@ .17
Dipped goods	lb.	1.00	@
India rubber	lb.	1.00	@
Ochre, domestic	lb.	.03	@ .03½
imported	lb.	.02	@ .03
Oil-soluble aniline	lb.	1.55	@
Rubber makers' yellow	lb.	3.50	@

Compounding Ingredients

Aluminum flake (carloads)	ton	22.50	@29.45
hydrate, light	lb.	.20	@ .22
Ammonia carbonate	lb.	.07	@ .09
Asbestine	ton	20.00	@25.00
Barium, carbonate	ton	48.00	@50.00
dust	ton	100.00	@
Barytes, pure white (carloads)	ton	23.90	@
off color (carloads)	ton	20.00	@
uniform floated (carloads)	lb.	23.90	@
Basofor	lb.	.04½	@
Blanc fixe	lb.	.04	@ .04½
Carrara filler (factory)	ton	18.00	@
Chalk, precipitated, extra light (f.o.b. factory)	lb.	.03½	@ .04½
heavy (f.o.b. factory)	lb.	.02½	@ .03¼
China, clay, Dixie	ton	22.00	@ 32.00
Blue Ridge	ton	22.00	@ 32.00
Cotton linters clean mill-run	lb.	.04	@
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	60.00	@
Glue, high grade	lb.	.30	@ .40
medium	lb.	.20	@ .26
low grade	lb.	.15	@ .18
Graphite, flake	lb.	.05	@
amorphous	lb.	.05	@
Infusorial earth (powd.)	ton	60.00	@
(bolted)	ton	65.00	@
Liquid rubber	lb.	.15	@
Mica, powdered	lb.	*.15	@
Pumice stone, powdered	lb.	.03	@ .05
Rotten st., powd. (bbls.)	lb.	.02½	@ .04½
Silica, aluminum	ton	22.00	@ 25.00
Soap bark, cut	lb.	.08½	@ .09
Soapstone, powdered-gray (carloads)	ton	12.00	@
Starch, powd. corn (bags)	cwt.	2.32	@ 2.42
(bbls.)	cwt.	2.60	@ 2.70
Talc, soapstone	Lton	22.50	@
Terra blanche	ton	22.00	@25.00
Tripoli flour, air-floated, cream or rose (factory)	ton	30.00	@32.50
white (factory)	ton	32.50	@33.50
Tyre-lith	ton	85.00	@
Whiting, Alba	cwt.		@
commercial	cwt.	1.15	@
Danish	ton		@
English cliffstone	cwt.	1.75	@ 2.00
gilders (bolted)	cwt.	1.20	@ 1.35
Paris, white, American	cwt.	1.35	@ 1.45
Perfection (factory)	ton	15.00	@22.50
Plymouth	ton	16.00	@18.00
Quaker	ton	13.00	@15.00
Wood pulp, XXX (f.o.b. factory)	ton	30.00	@
X (f.o.b. factory)	ton	25.00	@

Mineral Rubber

Gilsonite	ton	70.00	@
Genasco (factory)	ton	50.00	@52.00
Hard hydrocarbon	ton	32.00	@42.00
Soft hydrocarbon	ton	30.00	@35.00
320/340 M. P. hydrocarbon	ton	47.50	@50.00
300/310 M. P. hydrocarbon	ton	42.50	@45.00
Pioneer, M. R., solid (fac.)	ton	42.00	@44.00
M. R. granular	ton	52.00	@54.00
Robertson, M. R. (factory)	ton	35.00	@75.00
Rubrax (factory)	ton	50.00	@
States "A"	ton	50.00	@
No. 1	ton	45.00	@
Synpro, gran. M. R. (fac.)	ton	59.50	@70.00

Oils

Avoilas compound	lb.	.15	@
Castor, No. 1, U. S. P.	lb.	.11½	@
No. 3, U. S. P.	lb.	.10¾	@
Corn	lb.	.12	@
Cotton	lb.	.12½	@
Glycerine	lb.	.15½	@ .16
Halowax (500-lb. steel drums, returnable)	lb.	.27	@ .29
Linseed, raw, domestic	gal.	.88	@
Palm lagos	lb.	.08¼	@ .08½
Palm, niger	lb.	.08	@
Peanut	lb.	.11	@
Petrolatum, standard	lb.	.05	@ .08
Petrolatum, sticky	lb.	.08	@ .10
Pine, steam distilled	gal.	.90	@ 1.05
Rapeseed, refined	lb.	.13	@
blown	lb.	.14	@
Rosin	gal.	.40	@ .45
Synpro	gal.	.40	@ .80
Soya bean	lb.	.10½	@
Tar	gal.	.26	@ .30

Resins and Pitches

Cumar resin, hard	lb.	.09	@ .12
soft	lb.	.09	@ .12
Tar, retort	bbl.	9.75	@10.00
kiln	bbl.	9.00	@ 9.75
Pitch, Burgundy	lb.	.05	@
coal tar	lb.	.01½	@
hardwood	ton	60.00	@
pine tar	lb.	.03½	@
ponto	lb.	.08	@
Rosin, K (bbl.) 280 lbs.		5.90	@
strained (bbls.) 280 lbs.		5.50	@
Shellac, fine orange	lb.	.85	@

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.	.12½	@ .13½
Benzol (90%, drums [7.21 lbs. per gal.])	gal.	.27	@ .32
pure (drums)	gal.	.29	@ .38
Carbon bisulphide (dms. [10.81 lbs. per gal.])	lb.	.06¼	@ .07½
tetrachloride (drums. [13.28 lbs. per gal.])	lb.	.10½	@ .13
Paracymene (factory)	lb.	.15	@
Motor gasoline (steel bbls.)	gal.	.24	@
Naphtha, V. M. & P. (steel bbls.)	gal.	.23	@
solvent (drums extra)	gal.	.23	@
Toluol, pure (7.21 lbs. per gal.)	gal.	.30	@ .35
Turpentine, spirits	gal.	.87	@
wood	gal.	.83½	@
Xylol, pure	gal.	.45	@ .51
commercial	gal.	.31	@ .38

Substitutes

Black	lb.	.08	@ .13½
Brown	lb.	.11	@ .15
white	lb.	.09	@ .16
Brown factice	lb.	.07½	@ .14½
White factice	lb.	.08½	@ .15½

Vulcanizing Ingredients

Lead, black hyposulphite (black hypo)	lb.	.35	@ .42
Sulphur chloride (drums)	lb.	.05	@ .06
(jugs)	lb.		@
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.55	@ 2.90
(bags)	cwt.	2.30	@ 2.65
Sulphur flour, rubber 100% pure (bbls.) 240 lbs.		2.60	@ 3.15
(bags) 150 lbs.		2.35	@ 2.90
Superfine 99½% pure (bbls.) 210 lbs.		2.40	@ 2.90
(bags)	cwt.	2.00	@ 2.50

(See also Colors—Antimony).

Waxes

Wax, beeswax, white, com.	lb.	.45	@
ceresine, white	lb.	.12	@
carnauba	lb.	.16	@
montan	lb.	.04½	@ .05
ozokerite, black	lb.	.18	@
green	lb.	.26	@
paraffine	lb.	.25	@
sweet wax	lb.	.12	@

*Nominal.

The Market for Rubber Scrap

New York

The rubber scrap market for the last month has continued increasingly dull. Reclaimers are limiting their purchases of scrap to their actual needs which continue extremely restricted. This condition is a direct result of the persistently-low price for crude rubber and a change for the better is not yet in sight.

Under these conditions there is a minimum of business at low prices. The latter part of February some improvement was noted in demand for red tubes for export.

BOOTS AND SHOES. Prices have held steady within narrow limits under 3¼ cents per pound with very little call for the material.

MIXED TIRES. These have ruled at 75 cents per 100 pounds. They are practically without interest to reclaimers.

INNER TUBES. Dealers' bids have not risen above $3.75 per 100 pounds for No. 1 grade while mixed tubes have ruled fully one cent a pound less.

MECHANICALS. These continue, as for months past, to have no value.

Quotations for Carload Lots Delivered

March 27, 1922

Prices subject to change without notice

Boots and Shoes				
Boots and shoes	lb.	*$0.03	@	$0.03¼
Trimmed arctics	lb.	.02¼	@	
Untrimmed arctics	lb.	.01¾	@	
Hard Rubber				
Battery jars, black compound	lb.		@	
No. 1, bright fracture	lb.	.05	@	.06
Inner Tubes				
No. 1	lb.	.03¾	@	.04
Compounded	lb.	.02¾	@	.03
Red	lb.	.03	@	
Mechanicals				
Black scrap, mixed, No. 1	lb.	*.02¼	@	.03
No. 2	lb.	*.01½	@	.02
Heels	lb.	*.02½	@	.03
Horse-shoe pads	lb.	*.02½	@	.03
Hose, air brake	lb.	*.01	@	.01½
fire, cotton lined	lb.	*.01	@	
garden	lb.	.07	@	
Matting	lb.	*.01	@	
Red packing	lb.	*.04½	@	.05
Red scrap, No. 1	lb.	*.07	@	.08
No. 2	lb.	.05½	@	.06
White scrap, No. 1	lb.	*.07	@	.07½
No. 2	lb.	.06	@	.06½
Tires				
Pneumatic—				
Auto peelings	lb.	.01½	@	
Bicycle	lb.	.01	@	.01¼
Standards white auto	lb.	*.02¼	@	.02¾
Mixed auto	lb.	.00¾	@	.01
Stripped, unguaranteed	lb.	*.01	@	.01½
White, G. & G., M. & W., and U. S.	lb.	*.02¾	@	
Solid—				
Carriage	lb.	*.02¼	@	.02¾
Irony	lb.		@	
Truck, clean	lb.	*.01½	@	.02

* Nominal.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(978) A French rubber specialist desires to represent American manufacturers in France.

(979) Information is desired as to where rubber-makers' red may be purchased.

(980) Request is made for information regarding the manufacture of rubber bottle stopples.

(981) The address is desired of the manufacturer of a machine for applying wired-on solid tires to wheels.

(982) Inquiry is made for the addresses of manufacturers of rubber-box die materials.

(983) A reader asks for the address of concern manufacturing or supplying a cutter for cutting gaskets up to and including 24 inches outside diameter.

Trade Opportunities from Consular Reports

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet and state number.

DISTRICT OFFICES

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent Southern Railway, 96 Ingalls Building.
Dayton, Ohio: Dayton Chamber of Commerce.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.

(851) Cuban firm desires to represent manufacturers of asbestos and rubber goods. Samples requested.

(860) House-furnishing goods dealer in Austria will buy rubber office equipment; also desires agency. Quote c. i. f. German ports.

(861) There is a Colombian market for rubber tires. Quote f. o. b. New York or New Orleans, with catalogs, literature, and discount lists.

(867) Italian commercial agent will represent firms for sale of gymnasium articles and sporting goods. Quote c. i. f. Italian port, in French or Italian. Cash on delivery.

(877) English mercantile company will purchase carbon black, water-floated barytes, and asphaltum. Quote c. i. f. British ports. Cash against documents.

(883) French commercial agency will buy substitute for inner tires. Correspond in French.

(897) Spanish firm of wholesale druggists will buy hygienic supplies. Quote c.i.f. Spanish port in Spanish or French.

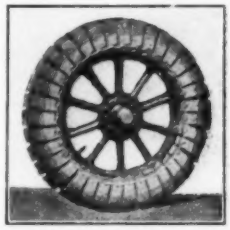
(902) South Australian merchant desires agency for sale of sporting goods, toys, and stationery supplies.

(917) Danish commission agency will represent manufacturers of tires and accessories, repair machinery and tools. Exclusive sale rights desired on consignment commission basis in Latvia.

(937) Spanish book and stationery supply house will buy office supplies, including pencils and rubber erasers. Quote parcel post rates, in Spanish.

CATERPILLAR TIRES FOR AUTOS

Instead of being sold to reclaimers, old tires are now being cut up into two-inch sections, perforated above the bead, and then linked with a suitable chain and applied over any pneumatic tire. It is claimed that such a covering will preserve both new and old tires a long time; that puncture troubles are almost impossible and blowouts reduced to a minimum; that non-skid chains are superfluous and traction is improved, especially in sand and mud; that breaking down of the sidewalls is obviated, as the openings between the sections save the covered tire by aiding in radiating heat; that a motorist is given the advantage of oversize tires by carrying him farther without extra power; that road shock, instead of being distributed around the casing ordinarily used, is limited to a few sections, thus contributing to make riding easier. When a tube is to be inserted in the inner casing, the latter and the "Caterpillar" tire, as the new device is called, are removed together. The tire has been patented in the United States and several foreign countries.—Caterpillar Tire Company of America, 1053 South Broadway, Los Angeles, California.



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